NATIONAL PUBLICATION FOR BUYING-USING-SELLING COMPUTER HARDWARE & SOFTWARE

FEBRUARY 1986
VOL. 6 NO. 2
ISSUE 73
$2.25
02927

COMPUTER SHOPPER™

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CHALLENGER HARD DISK Gives Apple IIe 20Mbyte Portable Power

In This Issue...

- *Paradox - An In-Depth Report*
- *Fall Comdex Wrap-Up*
- *By The Numbers — by Les Solomon*
- *Financial Programs For TRS-80, Model 100*
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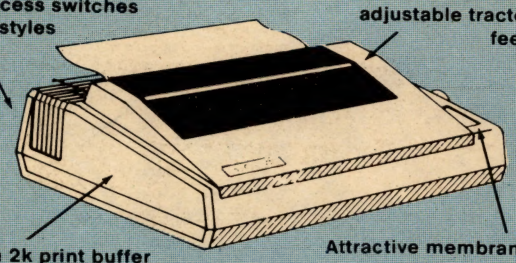

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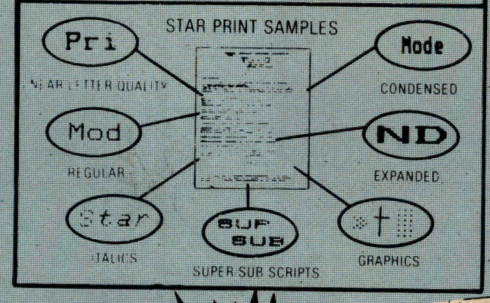

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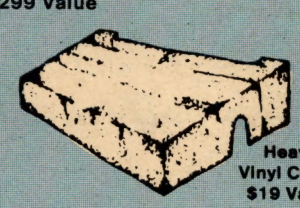

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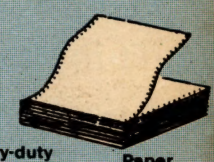

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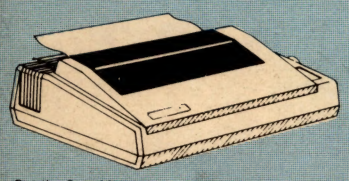

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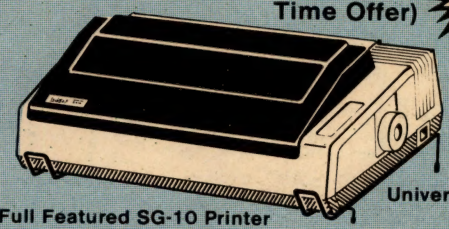

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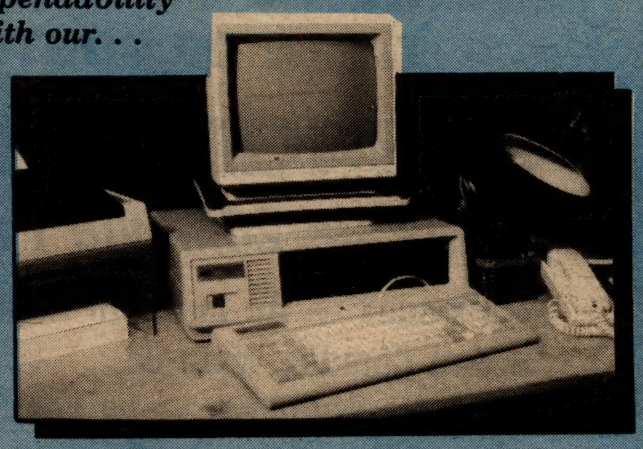

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Computer Shopper is published monthly for $18 per year by Computer Shopper, Inc., 407 S. Washington Ave., Titusville, FL 32796. Application to mail at Second-Class Postage Rates is pending at Titusville, FL and additional mailing offices. POSTMASTER: Send address changes to COMPUTER SHOPPER, P.O. Box 1419, Titusville, FL 32781.

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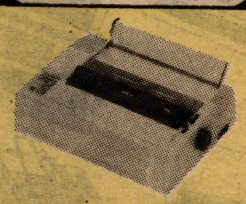

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Challenger Hard Disk Gives Apple IIe 20 Mbytes And Portability

by Rich Fields

The Apple II retains its versatility and extends its capacity with the addition of new software and massive add-in memory boards. Now Space Coast Systems has introduced an internal hard disk to increase the Apple's disk storage capacity to 10 or 20 Mbytes while retaining its portability and increasing the power available to the expansion slots in the computer. The secret of this seeming miracle has been to use of new 3 1/2 – inch Winchester hard disks designed to absorb more mechanical shock (60g non-operating) than any other Winchester ever available for micro-computers.

The Challenger (Fig. 1) is mounted in a new power supply assembly equipped with a fan. The new assembly replaces the original Apple Power Supply and not only powers the Winchester drive but supplies more power to the Apple than the original supply without the hard disk. The installation is so simple that it can be done by removing 9 screws and following the illustrated manuals. The complete operation takes about 15 minutes. The Challenger can be mounted in any Apple IIe but not in an Apple IIc. A version for the II+ will be available the first quarter of 1986.

The drives have a mean-time-between-failure rate of 35,000 hours of operation, a mean-time-to-repair of 20 minutes and a service life of five years. The drives do not require any service maintenance. Data is transferred at the rate of 5 Mbits per second with a track to track access time of 15ms. Average access time is 65ms with a maximum access time of 120ms. The 10Mbyte drive uses one disk with two recording surfaces and two heads. The 20 Mbyte drive has two disks with four recording surfaces and four heads. The flexture arm (Fig 2) that mounts the heads is automatically raised and locked in place when the power is removed. This eliminates the problem of head shock and since the head does not rest on the media it reduces media wear.

The Challenger operates with all four Apple II operating systems, DOS 3.3; PRODOS 1.1.1; Pascal 1.2 or 1.3 and CP/M 44K, 56K, 60K. It is preferred that the hard disk interface reside in Slot 7, which permits automatic boot from the hard disk. All DOS volumes are allocated on the hard disk. It allocates #254 as floppies. However all of this is transparent to the user.

One of the major features of the Challenger is that a version of DOS is supplied that is mapped for 2 Mbyte volumes and up to 16 volumes per user are allowed. Contrast this with early Apple II hard disk where the volumes were merely multiple 144K sections, equal to many Apple II diskettes.

The Power Supply of the Challenger is rated at 54 watts working,

Apple IIe with Challenger is a neat installation

providing more power for the expansion slots than the original Apple supply made by Astec and rated at 35 watts (working). Since many Apple IIs these days are equipped with very large memory boards (one or more megabytes) the additional power is necessary even if the hard disk is not installed.

The Challenger is compatible with three of the existing memory expansion boards, Apple's memory board; Multiram from Checkmate and Ramworks from Applied Engineering. These are the most popular large capacity memory boards now available.

The Challenger is also compatible with much of the new software for Apple II. This includes but is not limited to: Manzanita Accounting Software, Appleworks, Catalyst or Mouse Disk multi-user compatible OMNIS 1-2-3 data base multi-user package, WOSBASE multi-user data base and Great Plains Accounting Software.

Software utilities that are included with the Challenger give multiple user with password capability.

Multiple user designations (64 in all) with specific passwords may be added so that more than one person may use the same hard disk but have information secure from any other users.

If a multi user environment is desired, the Challenger can be connected to the Space Coast Systems Space Server; allowing more than one Apple II to share the Challenger.

In discussing any hard disk system, the question of back-up must be always kept in mind. To back up Challenger, Space Coast Systems, the manufacturer offers an external tape streamer drive. This does not need an interface, working directly off the Challenger unit. The back-up software, offers a Back-Up and Restore program that supersedes the operating system. It enables the user to back-up volumes by name and give the user the ability to back-up 2Mbyte files. (It tells you when to change floppies to either the standard 5¼" floppy or the new 800K 3.5" minifloppy.)

The Challenger sells for $1,195 for 10Mbytes or $1,595 for 20Mbytes. The Streamer Tape drive is $1,995. A full year limited warranty covers parts and labor, through an SCS Dealer on an exchange-out basis. The Challenger is available through dealers or direct from the manufacturer.

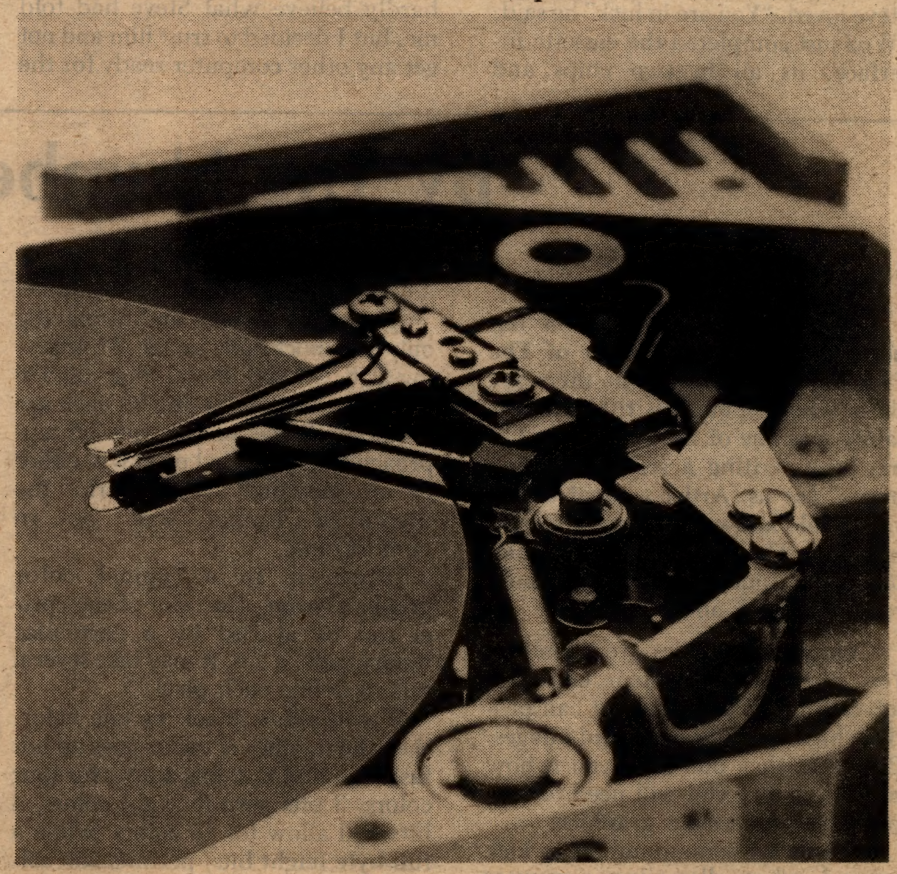
Conclusions:

Challenger is the finest and most practical hard drive for an Apple II. As a contrast, I think of using the first Corvus 10Mbyte (the infamous – Shoe Box –) which was bigger than the Apple and could not be moved under pain of head crash, unless you locked the heads in place with a screwdriver. The installation was a nightmare and if successful you got the equivalent of 70 144K floppies. It could not operate across volume boundaries. That was only a few years ago but it was a wonder in its day. Challenger on the other hand is modern in every respect. I recommend it to all Apple II users if you can afford it. There are other internal and external hard drives for the Apple II and many cost less, but the price of the Challenger is reasonable for rugged quality drives.

For further information contact Space Coast Systems, 401 S. Washington Ave., Titusville, FL 32796.

Other internal hard disks for Apple II have a controller board mounted under the keyboard and various cables snaking through the chassis. The externally mounted hard disks may work for stationary computer systems, but if you must move your system, you need the Challenger.

Mention that you read about it in the *Computer Shopper* for a special surprise. ●



Challenger rugged head assembly

Stan Veit's History

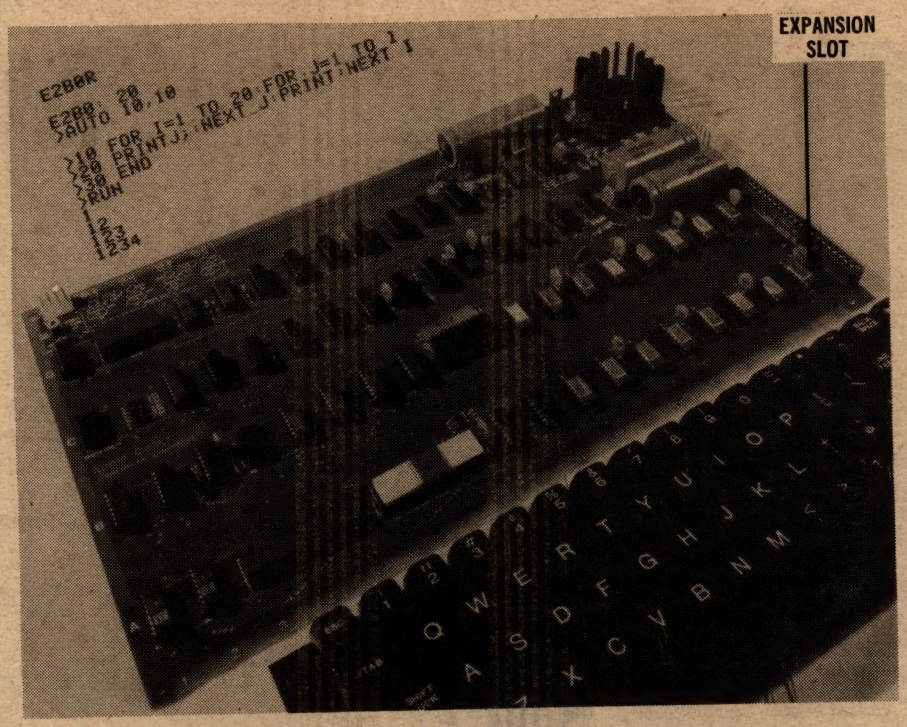
The First Showing Of Apple I In New York

In the Spring of 1976, I received an invitation from the Association For Computing Machinery (ACM), New York Chapter, to attend a meeting at which we would have the opportunity to display the new microcomputers for the first time. Finally the "big computer" people were noticing that we existed and that there might be something to these "toys" people were talking about.

A few telephone calls to my fellow computer vendors told me that they all had also been invited so I was determined to out display them all. It seemed that the thing to do was to display a completely new computer, one that they had never dreamed of.

We had just received the first Apple I from Steve Jobs and I thought that this was the way to show what a real "personal computer" looked like. The Apple I was a single PC board with the complete computer on it. You had to add the keyboard, the video monitor or connect it to a TV through an RF modulator, (Apple had not received permission to add a modulator from the FCC) and a power transformer from Radio Shack. There was no cabinet and no cassette interface. There was a single slot for something on the board (only Woz knew what it was for!).

Then I got an idea, I would mount the Apple I into an attache case and carry it to the meeting where I would astound those present with the worlds first portable computer! I got on the phone as soon as the time difference between Los Gatos and New York permitted and called Steve Jobs. This plan was just the kind of thing that Steve loved. "You are in luck" he said, "Woz just completed the cassette interface, its all in two chips and



Apple I with keyboard

operates at 1200 Baud." "Wow," was my only answer, then, "how does it work?" "Only Woz knows,"said Jobs. "You plug it into the slot on the board, connect any cassette recorder and load and save with commands in the monitor." "I can't believe 1200 baud", I answered, "But where do I get the software?'

'There's a package in the mail, with the interface and a cassette of The Game of Life, best you ever saw," said Steve Jobs, "let me know what happens."

Now you must realize that in those days we loaded programs and data from an ASR-33 Teletype, using paper tape at 110 baud. We also had cassette interfaces at 300 baud, but we got one good load out of ten attempts. I could hardly believe what Steve had told me, but I decided to trust him and not get any other computer ready for the meeting.

While we were waiting for the interface and tape to get to New York, I had the Apple I mounted into the case. Joe Sanger designed the installation and did the work. He mounted the board on the bottom with the keyboard above it on brackets. The top cover was finished in leather-like plastic and it really looked good. The 9" video monitor plugged in on the back of the case for a neat installation, somewhat like an Apple II with a leather cover. When the cassette interface arrived we found that Steve Jobs had not lied, it worked perfectly every time at 1200 baud! The only problem was that it stuck up through the leather-covered top board. It was too late for re-design so I went to the meeting with a big hole in the cover, our work of art became a kludge.

The interface and software tape arrived the day of the meeting and it took Joe all afternoon to mount the interface and rework the cover so it was not until 4PM that he taught me how to use it.

My wife and I showed up at the ACM meeting 15-min before it was scheduled to start and everyone asked where my computer was. The Altair dealer was there with a complete system including two racks of peripherals. An IMSAI dealer, Hal Sheer from Westchester was there with an IMSAI system. Also composed of several hand trucks of equipment. A DEC dealer was there with the new micro-PDP-11, all three tables worth. The teletypes were pounding, the fans were blowing, the paper tape readers were clicking when the Chairman banged his gavel for order. "Will the computer people please shut down their machines until after dinner," he said. "We also have some business to conduct before the demos." The switches were thrown and silence reigned again.

During the business part of the meeting, I loaded my tape into the Apple. It made no noise and no one realized what I was doing because it only took a few minutes."

While the other vendors were showing their systems I kept the monitor screen turned down. All of the micros were received with wonderment and the demos were all well done.

Then my turn came and I took the microphone while I turned up the screen on the video monitor. "Most of you have heard of the simulation of the growth of cells called "The Game of Life," as it runs on mainframes and large minicomputers. Well here is the same thing on the smallest complete computer you have ever seen, The Apple I. Anyone who cares to try it can step up and use the keyboard." Well after they all looked and tried the program, I was told that I was cheating! You were supposed to bring a computer, not a terminal from a time sharing company! It IS a computer, a real computer, I am not connected to anything. I then shut off the Apple and reloaded from the tape, running the same program but saving some of their patterns. They were finally convinced. "What you see is the future, not the big boxes from Altair, IMSAI and DEC." The real microcomputer will be a personal computer that anyone can carry with them and it will be called the Apple." None of those present ever bought an Apple I, but many of them bought Apple IIs and introduced them to their companies. This was indeed the start of Apple in New York City. It was also a big boost for my Computer Mart of New York which up to then had been called "The computer place in back of the toy store." The Apple I lasted until until the first Atlantic City Computer Show in 1976 when the two Steves introduced Apple Ib (an almost Apple II in a wooden box) in my booth. That is another chapter. ●

By The Numbers

by Les Solomon

Editor's Note: Les Solomon has been hailed as "The Father of The Personal Computer" while there are those who dispute this title, he certainly was one of the midwives. Les has been writing a series of "think pieces" for us. Articles about things you should know but no one else ever tells you. This is on video reproduction and is something everyone should read and think about.

Computer graphics are booming. Just about every system currently advertising boasts of how it can produce high-resolution colorful images. But what they don't tell you is how much memory you will need to support these marvelous graphics.

So here are some numbers to kick around when discussing computer graphics.

In its simpliest form, let us assume a display of 256 vertical pixels (pixel = picture elements), and displaying only a monochrome image. Multiplying 256 by 256 shows that 65,536 memory locations at one bit each are required. Since in this one-bit approach the associated pixel will either be on (glowing) or off (dark), the displayed image will be in monochrome.

However, in a typical color graphics system, the color of each pixel can be altered by a particular binary code. Thus, it may take several bits to define each pixel.

If you count black as one color, then the number of colors goes up hex fashion - that is, 2 bits allows for four colors, 3 bits permits eight colors, 4 bits will allow for 16 colors, while a full byte (eight bits) permits 256 colors. These numbers of chroma bits will be needed for each individual pixel.

Therefore, the 256x256 pixel display with sixteen colors (4 bits) means a memory requirement of 262 Kbits (32K of 8-bit RAM chips). If, for any reason, you wanted 256 colors (8 bits per pixel), then the memory requirement hops up to cover 500 Kbits (65K of 8-bit RAM chips).

A TV monitor that can use 512 by 1024 pixels per image requires 524,288 bits (65K of 8-bit RAM chips) for a monochrome image. If you want to use 16 colors (4 bits per pixel), then the system will need over 2 Megabits per frame (262K of 8-bit RAM chips). Obviously, using 8 bits per pixel means 256 colors and over half a Megabyte of memory per frame.

Now we come to the present day

continued on page 13

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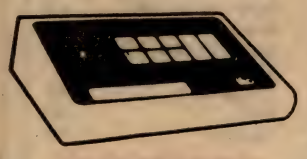

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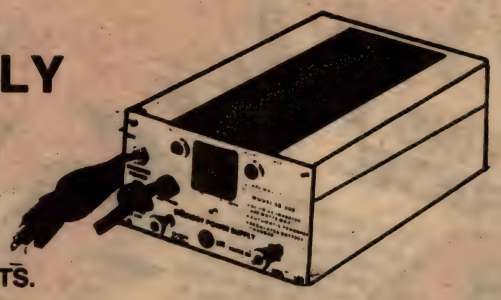

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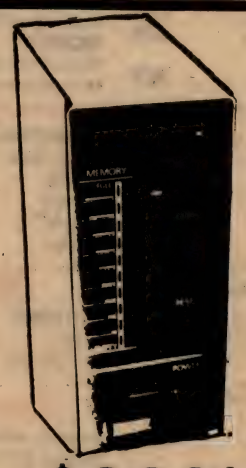

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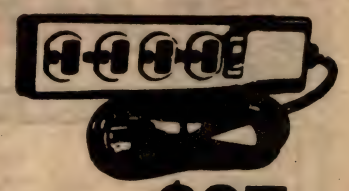

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Editorial

By Stan Veit

A Look Ahead In *COMPUTER SHOPPER*

Our rate of growth has surprised many people in the computer industry because we defy conventional wisdom. We used to be a pure Shopper, full of great classified ads and some mail order ads designed to save you money. The problem was people only bought us when they had something to buy or sell. Glenn Patch, our Publisher and owner lured me from the cold of New York City and put me to work to give you a publication you would buy every month.

Now we are STILL a Shopper, but with a difference. We give you all the money saving ads for new and used equipment, plus information you can get nowhere else. Hardware, software, peripherals, User Groups, Bulletin Boards, Sections on computers, no one other national magazine covers and unbiased straight facts on computers everyone covers.

You have responded to this treatment and made us grow up to become this big, fat publication, full of good things to buy and read about. Isn't this a great wishing book!

As we grew we have not been able to keep up with the demand for copies all over the country. This is about to change. We are going to put as many as three times the number of copies in circulation as we now have. In addition you will see *Computer Shopper* in places where it was previously not sold so it will become easier to buy. (The easiest way is to SUBSCRIBE!)

We are also going to give you the best year of *Computer Shopper* ever during 1986. We have made up our editorial calendar for the year ahead and we are planning some interesting issues for you. This does not mean that we will devote an entire issue to these themes, rather we will have major articles devoted to the topics listed in the calendar. With *Computer Shopper* being sectionalized into various areas of interest we never eliminate any section to accommodate the issue subject. We want to supplement your information, not omit your favorite subjects.

Be advised that our Editorial Calendar is not engraved in stone. If during the year some great event occurs that demands our available editorial space, we will use it to bring you the latest news and talk about our scheduled topic in a later issue. We have anticipated that Apple will announce something important at their annual stockholders meeting this winter and that IBM will announce the PC2 line this year. Equally important events from other manufacturers will receive the attention they deserve. One of the great things about *Computer Shopper* is our fast turn-around time between issues. Slick magazines need about three months to publish an issue, we do it in 10 days! Few other computer publications can put out such a large magazine in so short a time.

In the March issue we will look at IBM- compatible computers (commonly called clones) and discuss the best values offered to the buying public. We have done a lot of investigating and the results may surprise you. We will cover PC, XT and AT types and perhaps include some non-compatible MSDOS computers. If you plan on going MSDOS this year, the March issue is a must for you. Learn how you can keep up with the latest advances and still use the CP/M software you bought and paid for long ago.

In April we will explore the question of Hard Disk Backup and some new developments in the technology. Things like the super-dense – floppies – discussed in this issue, WORMS, CD ROMS, tapes and kinds of cassettes. What is the most – back-up for the buck? – Is the need for back-up being met by existing products?

May will feature a close look at all the "integrated software" now available on the market. What is it. What does a manufacturer mean when he calls his product "integrated software?" This is a group of articles you should not miss.

In June we are going to talk about the re- birth of the – Home Computer. – Although it never "died" the experts said it was dead last year. Now home computers are making a comeback without much fan-fare from the so-called experts. All you Apple, Commodore, Atari, CoCo, TI, and Sinclair fans will love this series.

July is considered an "off month" in the computer month because people go on vacation. Lets take a look at portable computers and printers to take along on your trip. Do you need them and what can they do for you?

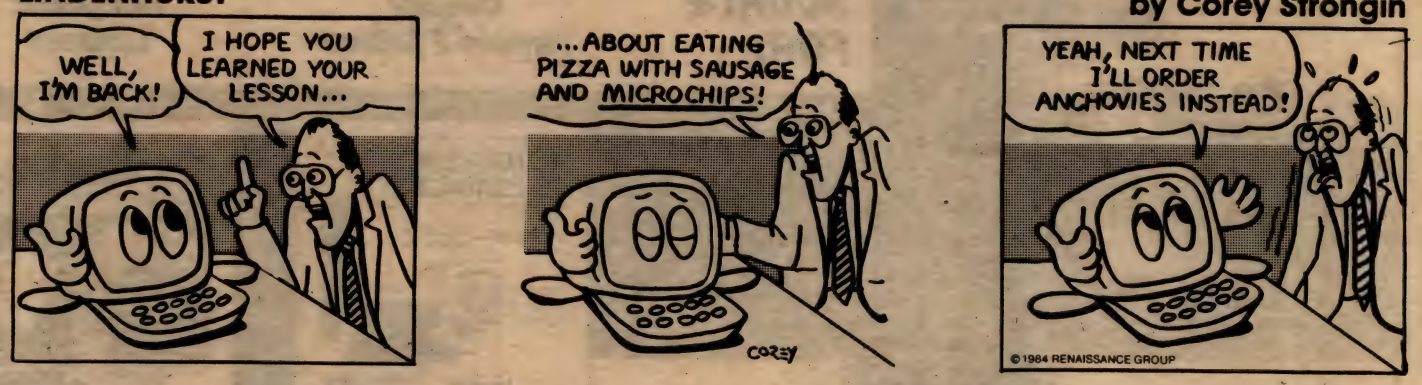
August is also a vacation month and perhaps a time to think about languages for computers. When personal computers started, you had to know BASIC to use them. Those who learned the language made practical use of the personal computer. Those who didn't played games. Then came Visicalc, WordStar dBase, SuperCalc, and application software of all kinds. Today 90% of all PC users never use a high level language, (unless you consider dBase as a Data Description Language). Still there are thousands who use Turbo Pascal and newer languages are coming out every day. *Computer Shopper* will examine the new computer languages and what they can do for you that someone else's application package will never do. Besides you may need to know Ada to get a job soon.

In September we look at personal computers in schools, where they are and where they are going. Since so many of our readers (and writers) are educators, this issue is going to be a landmark one. We invite educators and educational software developers to participate in the discussion in this issue.

We have a large group of readers and advertisers who are single-board computer users and fans. November is their month and the rest of you will be amazed by what you can do with these machines. Featured will be an article on putting together complete systems from components advertised in *Computer Shopper* at bargain prices. More Bytes For Your Buck and small is beautiful are themes for the single board computerist. Read all about it!

For the past three years we have celebrated the holidays with a Christmas Shopping List including one of my poems. Not this year! *Computer Shopper* is getting the awards fever. There are awards for everything these days. Every magazine has a special award issue and most of these are advertising sales gimmicks. We are going to be different, we are going to give awards to those who offer you the biggest bargains in several categories. *Computer Shopper's* Best Buy Of The Year Awards will be given to those who make your computer dollars go further. That is a fitting award for the magazine devoted to saving you money. your computer dollars go further. That is a fitting award for the magazine devoted to saving you money. ●

LINDENHURST **by Corey Strongin**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...ABOUT EATING PIZZA WITH SAUSAGE AND MICROCHIPS!
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YEAH, NEXT TIME I'LL ORDER ANCHOVIES INSTEAD!
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By The Numbers

continued from page 10

standard in images - 35mm color film. The video equivalent of this is about 2400x2400 pixels which is 5.76 Megabits per frame in monochrome. At 8 bits (256 colors) per pixel, the total memory requirement reaches some 46 Megabits per frame (or 5.76 Mbytes of 8-bit RAM).

If you know the amount of memory dedicated to the video display, you can get a good idea of what quality of vide image your computer can display.

Keep in mind that all the above memory is for one single frame. If you plan on any motion, even on partial frames, then you must add more memory.

Flicker. Did you ever wonder why the U.S. and certain other countries use 117-volts at 60 Hz, while Europeans use 220-volts at 50 Hz?

Well, it has to do with the fact that many years ago, when the U.S. went from a dc power line system to an ac power line system, illumination engineers were worried about the flicker that would take place in an incandescent lamp as the applied power alternated around zero.

Flicker becomes perceptible at about 20 Hz depending on the intensity of the light source, with the higher the intensity, the higher the flicker threshold. Early movies were somewhat dark and worked at 24 frames per second, thus were very close to the minimal flicker rate. That is why they were called "flickers" and the term "let's go to the flicks" originated.

To make sure that incandescent lamps would not flicker, American illumination engineers settled on the relatively high alternating rate of 60 Hz. The 117-volts was determined by the power engineers as being high enough to allow decent power to flow, yet low enough not to jump gaps and present a danger to the population.

However, European engineers had other ideas. They figured that doubling the voltage (thus halving the current for the same power) allowed using thinner (and lower copper cost) transmission lines -- and thus they established 220 volts as their power standard.

They also expected their public to use a lower level of illumination, so they reduced the alternating frequency to 50 Hz -- still far above the flicker rate, with the 10-Hz reduction translating into nearly a 10-fold decrease in allowable luminance.

This change in line frequency also influenced the design of European TV receivers (and later on computer video monitors).

continued on page 14

By The Numbers
continued from page 13

In the early days, many TV receivers would display a wide dark horizontal "hum bar" across the screen caused by the management field generated by the power transformer affecting the electron beam of the CRT. To see how a magnetic field affects a CRT, if you place even a weak magnet against the CRT faceplate, you will note a change in the display image.

Since viewing a TV image with a stationary dark band across it is far better than trying to watch an image with a distracting dark band floating up and down the screen, the TV vertical frequency was chosen to be the same as the power line frequency. Hence, a video vertical rate of 50 Hz in Europe and 60 Hz essentially everywhere else.

The use of a 50-Hz vertical rate - 1/50th of a second versus the faster 1/60th of a second - permits more display information to be transmitted during each refresh cycle without increasing the bandwidth, thus allowing the Europeans to increase the vertical resolution of the display.

This explains why travellers coming back from Europe usually say that "TV looks much better over there than it does here." There are other differences in TV standards in different parts of the world. Some specifications including the new proposed High-Resolution TV are shown in Table 1.

TABLE 1. MONOCHROME TV STANDARDS

	U.S. Broadcast	European Broadcast	U.S. Closed-Circuit	U.S. High-Resolution
Lines/Frame	525	625	525	see below
Field Rate	60	50	60	60
V-interval (US)	16,667	20,000	16,667	16,667
V-blanking (US)	833	1,200	1,250	1,250
V-sync pulse (US)	190.5	192	150	150
H-interval (US)	63.5	64	63.5	see below
H-blanking (US)	11.4	12.8	10	7
H-sync pulse (US)	5.1	5.8	4.8	2.8

U.S. HIGH-RESOLUTION TV (EIA RS-343, APPENDIX II)

Lines/Frame	Active Lines	H-Interval (US)
675	650	49.5
729	702	45.7
875	842	38.1
945	909	35.3
1023	985	32.5

Bandwidth. Some more numbers to kick around.

If you have a computer that delivers a video output, and you plan on purchasing a video monitor for it, what kind of bandwidth will you be looking for?

Some people will tell you to get the most bandwidth you can afford - a good idea by the way. But, if you are like me, you have a budget and many video monitors seem to increase their price in "big bucks per MHz."

It would be nice to know what kind of bandwidth your system delivers so you can make the right choice.

Before we go any further, you should understand that conventional monochrome TV uses 15,750-Hz horizontal line frequency. A built-in phase-locked loop (PLL) allows the receiver line oscillator to "lock" onto the incoming horizontal sync signal. The PLL can lock onto incoming frequencies a few kHz on either side. This is why a computer having a 15- to 16-KHz line frequency can lock a conventional TV receiver or video monitor.

To check your computer's required video bandwidth, look in the manual and note how many horizontal pixels per line, how many horizontal lines the video delivers, and the vertical frequency. In the following example, we will assume 256 pixels per line, 60-Hz vertical frequency, and 260 horizontal lines. Of course, you can plug in your own numbers to see what your system can do.

Perform the following:

1. Determine the horizontal frequency by multiplying the number of horizontal lines by the vertical frequency. (260 x 60 = 15,600 Hz.)

2. Determine the reciprocal (1/X) of the horizontal line frequency. (1/15,600 = 64.103 microseconds.)

3. Divide this number of microseconds by the number of pixels per line (64/256 = .25.)

4. Then take the reciprocal of this number to determine the monitor bandwidth (1/.25 = 4 MHz.) To account for the time lost in the horizontal blanking interval, and in pixel rise time, about 10- to 20-percent or so should be added to the required bandwidth.

The above example shows that this particular video signal can be used with a TV receiver whose bandwidth is limited (by its own specs) to 4.3 MHz.

However, to use very high resolution graphics, many modern computers require a horizontal line frequency much higher than the standard 15-kHz of TV. For example, a state of the art system generating 1280 pixels per line and 1024 horizontal lines at 60 Hz vertical requires a horizontal frequency at 61.44 KHz.

Using the analysis shown above, note that the 1280 pixels per line must be displayed in 16.27 microseconds (1/61,440). This means that the video signal requires a monitor having 78-MHz bandwidth. Adding some bandwidth to account for lost line time, means that a video bandwidth of about 100 MHz should be used for this system.

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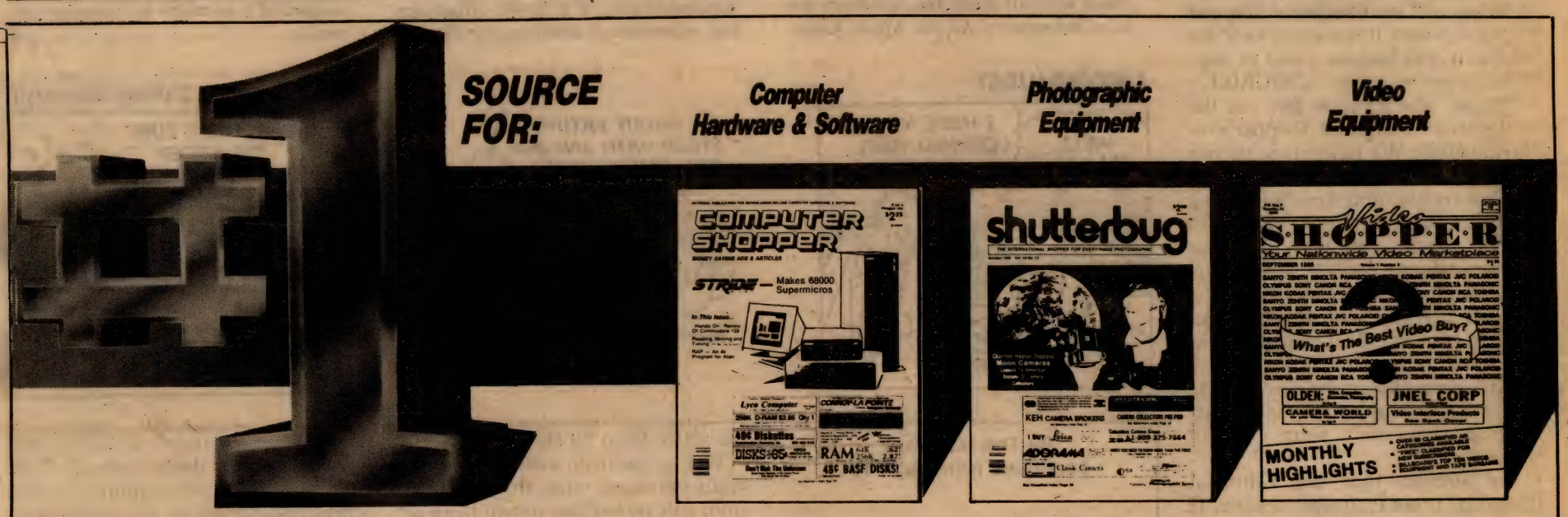

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Kodak Introduces New High Capacity Disk Drives

Eastman Kodak Company has introduced a family of disk drives and media that provide computer users with expanded capacity, increased reliability, and the flexibility needed to meet sophisticated application requirements.

The three high-density magnetic disk drives feature ten megabytes of formatted storage capacity available with the 12.0 drive; 5.24 megabytes with the 6.6 and 2.78 megabytes with the 3.3 drives.

The 12.0 megabyte drive was developed in conjunction with Data Technology Corporation of Santa Clara, Calif., as a joint technology agreement funded by Kodak.

The 12.0 megabyte product is an "intelligent" 5¼-inch half-height removable cartridge drive. It offers average access times (75 milliseconds) and internal transfer rates (2 megabits/second) similar to those available with hard drives. One special feature is a built-in controller with an embedded Small Computer System Interface (SCSI) which allows the drive to directly communicate with mainframe and personal computers.

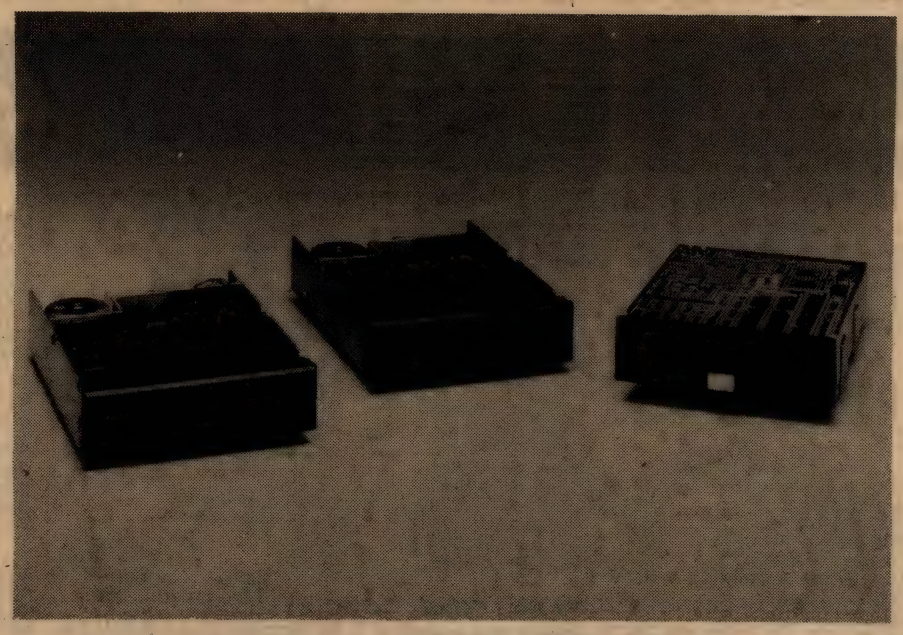
The 6.6 disk drive is a 5¼-inch half-height flexible disk drive. It offers a fast 3-milisecond, track-to-track access time, and 500 kilobits/second transfer rate. The drive features downward-read capability which allows users to read data stored on drive/media combinations such as those found with IBM PC and PC-AT computers.

The currently available 3.3 megabyte product is also a 5¼-inch half-height flexible disk drive. Like the more advanced 6.6 disk drive, it offers a fast 3-millisecond, track-to-track access time, 500 kilobits/second transfer rate, and downward-read capability.

All of the Kodak drives use high-density, servo-embedded 600-oersted 5¼ HD diskettes supplied by its subsidiary, Verbatim Corp., of Sunnyvale, Calif. For the 12.0 megabyte drive, the diskette is encased in a hard cartridge which provides increased protection against shock and vibration, as well as dust, moisture and other environmental factors. The cartridge media features two write-protect zones allowing the user to safely store applications on one part of the disk and data on the other.

Because precisely locating data on the disk and then centering the head on the correct track are critical requirements for quick, error-free retrieval of data in high-capacity systems, the Verbatim diskettes are preformatted at the factory with magnetic information that marks either side of each track with a code at the beginning of each sector.

This code is interpreted by a proprietary track-following servo system. The servo technique is widely applied in high-capacity hard disk systems and uses a special computer chip to quickly find the requested track on the diskette. The drive head is then centered on the track using either a voice coil motor for the 12.0 megabyte drive or stepper motors for the 6.6 megabyte and 3.3 megabyte drives.



Left to Right — Kodak 3.3, 6.6 and 12.0 Mbyte Drives

Increased data storage capacity of the 12.0 drive requires even more sophisticated technology. One factor which allows for the 10 megabyte formatted capacity of the drive is a patent-pending variable rate recording process which designates two recording rates for the diskette: a faster rate for the outer tracks and a slower rate for the higher-packed inner tracks. Most drives record at a constant fixed rate.

Kodak envisions high-density removable disk drive systems as the solution for a variety of storage needs. We feel Kodak drives fill an important gap caused by the low capacity of traditional flexible drives and the lack of removability of hard drives, according to Peter Giles. Our systems provide effective and efficent primary, back-up, and add-on solutions for data storage problems.

Servo Technology Improves Data Storage For Kodak 6.6 and 3.3. Disk Drives

The old saying, "Necessity is the mother of invention," retains its folk wisdom today, as many computer users are finding that they require data storage capabilities beyond the 1.6 megabyte drive systems currently used with most personal computers. Engineers have met this need by applying more sophisticated technologies to the Kodak 6.6 and 3.3 disk drive systems, resulting in formatted storage capacities of 5.24 megabytes and 2.78 megabytes, respectively.

This increased capability results primarily by changing the disk drive from a mechanical device to a "smarter" interactive system which is capable of correcting its track position. This sophistication is gained through servo technology combined with a thinner read/write head, high-capacity diskettes, and a dual-stepper motor system. But the best way to see how this technology improves capacity is to first review the operation of conventional disk drives.

Disk drives use the same "random" access concept as a record player. In a record player, one moves the tone arm to a groove close to a song's starting point. In a disk drive, the read/write head is automatically moved near the track containing data. Instead of one long, continuous groove like that found on a phonograph record, a conventional diskette has 48, 96, or more concentric tracks.

Most conventional disk drives read diskettes that have a series of holes arranged in a ring around the center, marking individual sections or "sectors" within a track. These "index" holes determine where a given track begins on a diskette; a light shining through the hole in the diskette is detected by a photocell in the disk drive.

The sectors are delineated by magnetic information when the disk is first formatted for use. Such diskettes are called "soft-sectored" because the size of the individual sectors varies due to the software on different computer systems.

A read/write head can be stepped out to any place where desired information is located on the flexible polyester disk. Once the disk drive knows where each track and sector begins, the information can be read or written by moving the head which is located on a movable carriage assembly. This process is completely mechanical. There is no feedback between the head and the media; the head does not know if it is positioned correctly on the diskette.

Most disk drives find a given track simply by moving the disk head a prescribed distance from the diskette's center or edge. Stepper motors position the head with sufficient accuracy to find a track. During this process the head is actually touching the diskette, much like the way cassette tape physically passes over the record-and-play heads.

This process works well for diskettes with a low number of tracks per inch (96 tpi) because there is enough room on the media to allow for a margin of error. In order to increase capacity, however, more tracks must be packed onto the diskette. Then, the conventional method of reading the diskette no longer is accurate or efficient. In other words, there is no room for tracking errors with high-capacity media.

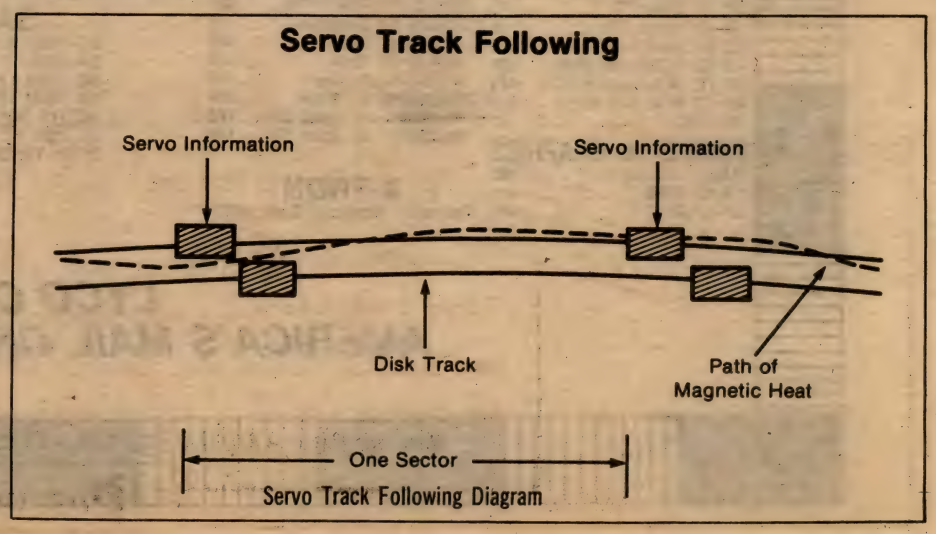
The Kodak disk drives use high-capacity diskettes with 192 and 384 tpi. This doubling and quadrupling of track density requires a special method of marking and reading tracks, a method known as servo technology.

The first step in this proprietary technique is preformatting the Kodak HD 600 diskettes with a magnetic code on either side of each track at the beginning of a sector. This code serves as a permanent "road map," providing track and sector locations and servo signals that remain constant regardless of errors due to drive variables or distortions in the media.

The next step is using a dual-stepper motor system. The coarse stepper motor moves the head to the nominal position of the track. Then a fine stepper motor, which is actively servo-controlled, centers the head over the track as it follows it through disk rotation, marking corrections as needed.

As the read/write head follows the track, it detects the servo "bursts" or signals that are placed along the track at the beginning of each sector, 17 times each revolution. These bursts of

continued on page 20



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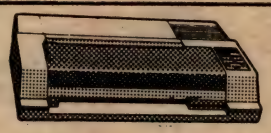

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By The Numbers
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In another example, using Table 1 as a guide, assume a high-resolution image of 875 lines. As shown in the Table, the H-interval for an 875-line interlaced display is 38.1 microseconds. From this, subtract 7 microseconds for the H-blanking interval, which results in an active scan line duration of 31.1 microseconds.

If 1024 pixels are to be displayed across each line, then divide 31.1 by 1024 for 30.4 nanoseconds per pixel. Dividing this into one second shows that the bit readout is some 32 million per second. If you allow a half-cycle per bit, a video system of about 16 MHz is required. When you add some bandwidth for rise time, then a video system between 25 and 35 MHz should be used.

All the bandwidths discussed apply to the image seen on the screen. However, there are two elements involved - electronic (the circuits) and mechanical (the CRT and its associated yoke and convergence components).

Generating broad bandwidth in an electronic circuit is a matter of circuit design, and it becomes relatively easy to design and build circuits that can reach hundreds of MHz bandwidth (consider the amplifier bandwidth of a good scope, or circuits that use stripline techniques).

However, the color CRT is another story. There are several mechanical bandwidth limiting elements inherent in the construction of the color CRT.

In general, the physical spacing (pitch) of the red, green, and blue phosphor dots on the faceplate is the main villian. The state of the art in pitch for 13- and 19-inch color CRTs is currently 0.31 mm. Some manufacturers have tried closer spacing between the holes in the shadowmask, but this makes it more difficult (expensive) to manufacture.

Although pitches as low as 0.2 mm have been produced in small quantities, they are not yet available on the market. The reason is that it costs a lot of money to manufacture a color CRT to these tolerances, and many manufacturers are not prepared to go this route unless large orders come in.

To use 0.2-mm pitch also means that the three electron beams be made much finer. This will require more research (expensive) and more exacting (expensive) CRT manufacturing machinery.

One manufacturer (Panasonic) is making a 98-inch CRT using a 0.28 mm pitch with a resolution of 576 x 480 pixels, a 15-kHz horixontal frequency, and 15-MHz bandwidth. Sony is making a Trinitron CRT having a 0.25-mm pitch and providing 640 x 240 pixels and 30 MHz bandwidth.

Another problem with color CRTs is that any (even slight) misconvergence can produce two or three slighly offset images (red, green, or blue), thus producing image fuzziness. If you have ever tried to converge a color CRT you know the problem. It is possible to get a well converged image, but despite the effort the technician puts in, good results depend very much on the tolerances of the various CRT mechanical components, such as elements within the CRT, the yoke, convergence coils, and convergence magnets. This problem can be compounded by external magnetic fields affecting the shadow mask, or metal objects physically close to the CRT.

Conventional color CRTs and their associated components are mass produced for essentially 4.3-MHz TV images, and will usually not be good enough for high-resolution computer-generated images.

But, what of LCD video displays? These unique readouts have been used for years in test instruments such as digital multimeters, in digital watches, and in many other systems that require a relatively static alphanumeric display.

However, in the past year or so, LCD displays have been improved to the point where they are used in pocket video games, and in those small-screen, super-portable TV receivers currently available at low cost.

And, the LCD picture is getting better. Some Japanese companies are testing an LCD technique using "supertwisted birefringence effect" (SBE), to produce 12-inch wide units having 640 x 400 pixels. However, the frame response time of 200 milliseconds prevents using this new technique for TV or moving graphics displays, but allows use for relatively slow alphanumerics. Also, at the moment, the LCD display is monochrome (pale green). Rumor has it that IBM is considering using the SBE display in a future laptop computer.

Another type of LCD being worked in the laboratory is called "ferroelectric," and has a response time of about 150 microseconds, a little too slow to display motion. Experiments have shown that operation at 20 microseconds is possible.

In the flat screen TV a different process is used. The video signal activates a selected number of dot-like picture elements (pixels) in each row, one row at a time. Switching these pixels on or off is controlled by microscopic thin-film transistors (TFTs) placed at each pixel. The image is formed not by phosphors but by liquid crystals, which respond to electrical signals from the video circuits. When a pixel is "on," the liquid crystal blocks out light. When it is "off" the crystals let light through. This process has been used in calculators and watches but up to now the crystals used have been too slow to form a good TV image. In addition they did not have enough contrast to be seen when used on a large area.

The engineers at Swa Siekosha the research group that serves Epson and Seiko has largely overcome these problems. They also can produce color images by placing thousands of microscopic red, green and blue filters over each pixel electrode. ●

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H022

Kodak Introduces
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information are arranged on either side of the track, but not at the exact same place. Instructions built into a special EPROM (erasable proram-mable read only memory) chip interpret the servo bursts information by comparing the amplitude (signal strength) of the right burst with the left. If one is stronger than the other, the EPROM's instructions tell the disk drives microprocessor to move the head back toward the center.

In contrast, conventional disk drives use the head and stepper motors in a completely mechanical process which doesn't allow for interaction between media and drive. Besides their inability to accurately read high-capacity media, conventional disk drives may have more errors reading diskettes which have been used in different drives or have been affected by environmental factors, such as moisture and dust, that change the shape of tracks.

The finely tuned servo technology works in conjunction with a flat read/write head. This head is thinner than the type found in conventional drives. Essentially, in the world of disk drive design the thinner the read/write head, the more potential for increased storage capacity. In fact, one major reason for the doubling of capacity between the 6.6 and 3.3 drive system is the thinner design of the 6.6 read/write head. More precise hardware and an automatic gain control mechanism also provide improved capacity for the 6.6 disk drive.

Both the 6.6 and 3.3 drives feature fast 3-millisecond access times and transfer rates of 500 kilobits/second. The drives also offer downward capability to read conventional 5 1/4-inch 48 and 96 tpi diskettes. A microprocessor in the drive automatically detects whether the inserted diskette is a HD 600 or lower-capacity media.

Besides increased capacity, Kodak engineers designed the 6.6 and 3.3 drives with other necessities in mind. The drive requires no preventive maintenance and offers enhanced servicability due to a brushless dc motor and no internal cables. Media is protected from mechanical or user error by an absolute vertical clamping mechanism, a door lock, and a clearly marked activity light.

The end result of this combination of servo technology, high capacity media, dual-stepper motors, and thinner head design is a family of disk drive systems which provide a high performance, low-cost solution to the data storage needs of today's computer users.

For more information contact Robert C. McEwen, Corporate Communications, Eastman Kodak Company, 343 State Street, Rochester, N.Y. 14650. Phone: 716-724-4241.

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What the world really needs is a 69 cent Double Sided, Double Density Diskette with a LIFETIME WARRANTY!

And DISK WORLD! has it.

Introducing Super Star Diskettes: the high quality diskette with the lowest price and the best LIFETIME WARRANTY!

In the course of selling more than a million diskettes every month, we've learned something: higher prices don't necessarily mean higher quality.

In fact, we've found that a good diskette manufacturer simply manufactures a good diskette...no matter what they charge for it. (By way of example, consider that none of the brands that we carry has a return rate of greater than 1/1,000th of 1 percent!)

In other words, when people buy a more expensive diskette, they aren't necessarily buying higher quality.

The extra money might be going toward flashier advertising, snazzier packaging or simply higher profits.

But the extra money in a higher price isn't buying better quality.

All of the good manufacturers put out a good diskette. Period.

How to cut diskette prices ...without cutting quality.

Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

There are about 85 companies claiming to be "diskette" manufacturers.

Trouble is, most of them aren't manufacturers.

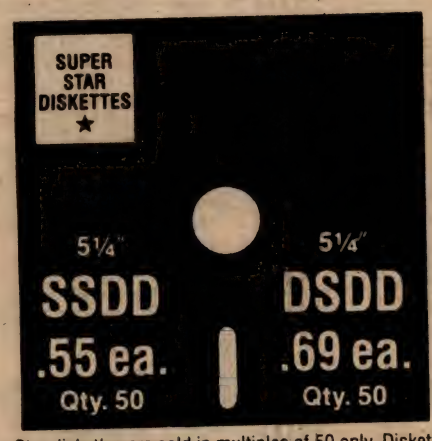
Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product.

The new IBM diskettes, for example, are one of these. So are IBM 5¼" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices...without lowering the quality.

We would go out and find smaller companies to manufacture a diskette to our specifications...specifications which are higher than most...and simply create our own "name brand" diskette.

Name brand diskettes that offered high quality at low prices.



Super Star diskettes are sold in multiples of 50 only. Diskettes are shipped with white Polymer-impregnated cardboard sleeves, reinforced hubs, user ID labels and write-protect tabs.

Boy, did we get lucky. Our Super Star Diskettes are the same ones you've been using for years...without knowing it.

In our search for the low priced, high quality diskette of our dreams, we found something even more interesting.

We found that there are several manufacturers who don't give a hoot about the consumer market for their diskettes. They don't spend millions of dollars in advertising trying to get you, the computer user, to use their diskettes.

Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and sell them for much higher prices to you!

After all, when a software publisher or computer manufacturer or diskette marketer puts their name on a diskette, they want it to work time after time, everytime. (Especially software publishers who have the nasty habit of copy-protecting their originals!)

Super Star Diskettes. You already know how good they are. Now you can buy them...cheap.

Well, that's the story.

Super Star diskettes don't roll off the boat from Pago-Pago or emerge from a basement plant just east of Nowhere.

Super Star diskettes have been around for years...and you've used them for years as copy-protected software originals, unprotected originals. Sometimes, depending on which computer you own, the system master may have been on a Super Star diskette. And maybe more than once, you've bought a box or two or more of Super Star diskettes without knowing it. They just had some "big" company's name on them.

Super Star Diskettes are good. So good that a lot of major software publishers, computer manufacturers and other diskette marketers buy them in the tens or hundreds of thousands.

We buy them in the millions.

And than we sell them to you.

Cheap.

When every little bit counts, it's Super Star Diskettes.

You've used them a hundred times...under different names.

Now, you can buy the real McCoy, the same diskette that major software publishers, computer manufacturers and diskette marketers buy...and call their own.

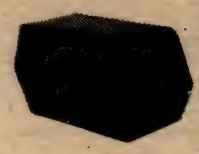
We simply charge less.

Super Special!

Store 75 diskettes for only $5.95!

Yep, that's right: order 50 Super Star diskettes, add $5.95 and we'll include a Media Products DISK MINDER II...a well made unit that we're impressed with.

It holds 75 diskettes securely and looks nice too!



FRAUD ALERT!

Please be careful!

A lot of the "no-name" diskettes flooding the market at prices of less than $1.00 are what we in the industry call "floor sweepings."

In other words, they're garbage...stuff that six months ago, no self-respecting manufacturer would have sold.

But times got tough and some people's scruples got a little lost in desperation...and so a lot of computer users are getting some really bad disks...and that isn't bargain at all.

So, when the price seems too good to be true...like 39 cents, be careful...very careful!

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MINIMUM ORDER: $35.00.

The Super Star LIFETIME WARRANTY!

Super Star Diskettes are unconditionally warranted against defects in original material and workmanship so long as owned by the original purchaser. Returns are simple: just send the defective diskettes with proof of purchase, postage-paid by you with a short explanation of the problem, and we'll send you the replacements. (Incidentally, coffee stained diskettes and diskettes with staples driven through them don't qualify as "defective".)

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The right prices. The right

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COMX		
130 Watt Power Supply	$179	$ 93
EVEREX		
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JRAM II board	$219	$159
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TECMAR		
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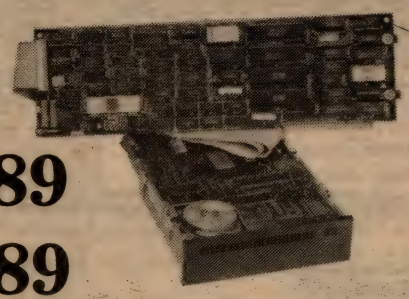

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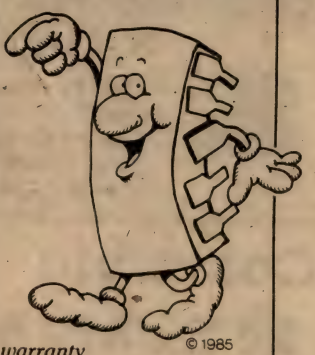

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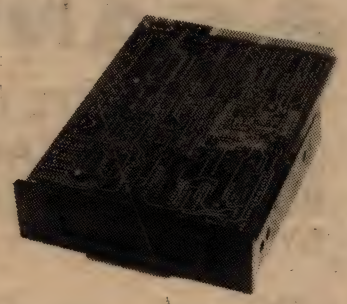

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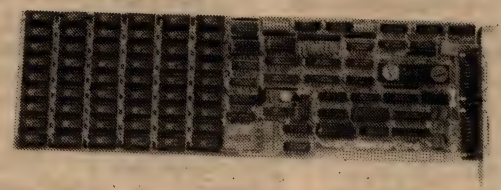

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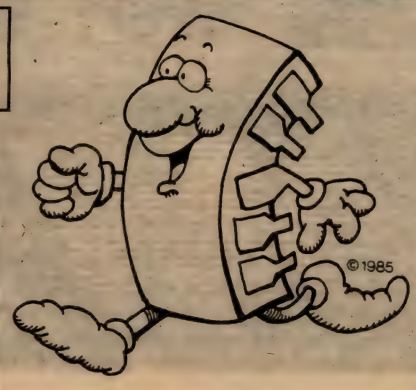

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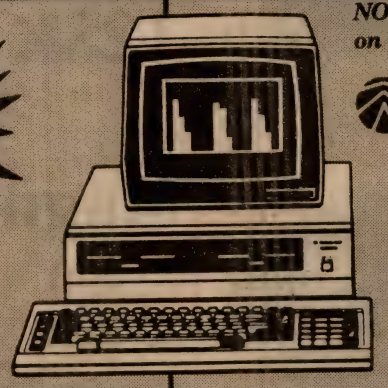

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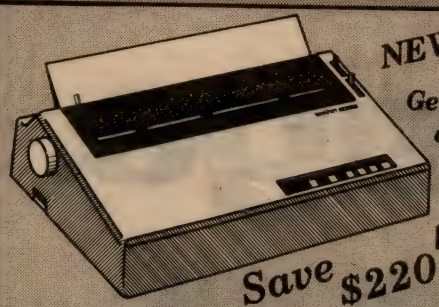

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Printout quality need not be sacrificed simply because of cost. Not only does the HR-15XL give you daisywheel printing at a price that's unbeatable, but added built-in attractions such as a 3k memory buffer (5k optional) for smoother printing and text reprinting to reproduce originals comes standard. Remarkable features such as two color printing and shadow printing gives your letters that added touch of importance. To increase the versatility of the HR-15XL, **brother** has an optional KB-50 Human Engineered typewriter keyboard to turn your HR-15XL into an electronic typewriter with automatic correction capability. Since the HR-15XL is a result of **brother's** advanced technology gained by long years of experience in the electronic office machine field it embodies such welcomed features as bi-directional 17cps printing, proportional spacing, automatic underlining, and super and sub script capability. Supplied either with Centronics parallel or RS-232C interface, the HR-15XL is compatible with most all small computers available on the market. Such options as the cut sheet feeder and tractor feeder offer further versatility to the HR-15XL — in a class way ahead of the rest.

NEW

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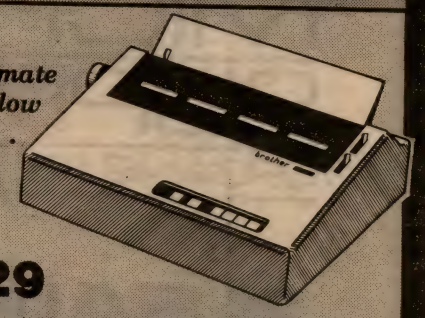

brother HR-10 DAISYWHEEL PRINTER

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The NEW **brother** HR-10 gives you superb quality and advanced technology from the company that has long years of experience in electronic office machines. The HR-10 is not only a high quality unit but a printer that will last with a snappy 120 word per minute print speed. It uses the renowned **brother** cassette daisywheels for ease in changing and the **brother** mess-less ribbon cassettes. And with the text reprinting feature you can set the HR-10 to continuously print out whatever is stored in the 2k memory buffer — all this at the touch of the front panel control. Control codes emulate Diablo 630 codes for universal compatibility with most software. Other standard, time-saving features include super and sub scripting, automatic underlining, and bold printing giving your printout a professional quality cleanliness. The HR-10 is capable of printing most 4 part forms and accepts a paper width up to 11½ inches. This new addition to the **brother** HR series represents an outstanding value for a personal daisywheel printer.

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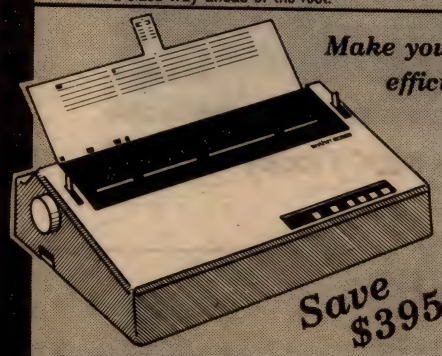

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brother's HR-25 daisywheel printer has been specially engineered to keep pace with your high volume while producing clean, clear pages of the most beautiful letter quality. Since the HR-25 incorporates a 3k buffer and can print out bi-directionally at a rate of 23 cps, output will never lag behind demand. Once into the buffer, information will be held for repetitive printout with the text reprint function — originals can be produced without end. Previously if you desired to stress certain areas of a text you had to underline the area or type it in uppercase letters. The HR-25's bold type function and red color printout make those stress points literally jump off the page, an especially welcome feature for important reports and letters. Character pitch is selectable among the settings of 10, 12, and 15 positions per inch in addition to proportional spacing. Other features such as super and sub script, auto underlining, carriage skip movement, and easy drop-in ribbon cassettes and daisywheels put the HR-25 ahead of the competition. It is equipped with either a centronics parallel or an RS-232C serial interface and DIP switches conveniently located for easy access, the HR-25 is easily adapted to your computer system. With **brother's** renowned reliability and easy add-on accessories (cut sheet feeder, tractor feed) the HR-25 will increase your office efficiency to unexpected levels.

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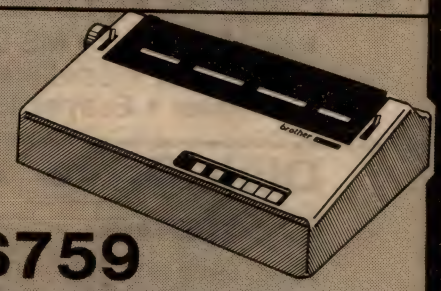

brother HR-35 DAISYWHEEL PRINTER

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One of the main concerns in a high output office is putting out the work required without concern. **brother's** HR-35 will not only print out whatever is on your word processor's mind with the finest daisywheel beauty, but will print it out with a speed (32 cps) and accuracy that will keep your work moving in the right direction. Because the HR-35 incorporates a big 7k (23k optional) buffer memory, your computer will be free for other operations almost as soon as you give it the print command. And that buffer won't stay full for long, thanks to HR-35's 32 character per second print speed and bi-directional logic seeking carriage movement. But the HR-35 does not give up efficiency for speed. Since the printer head comes to a full stop at each strike zone, the high quality of the daisy wheel is taken full advantage of. HR-35 presents you with a host of other welcome features such as two color and bold printing, just the thing to make your text stand out. Extras include super and sub script function, auto underlining, proportional spacing, text reprinting, clear buffer and easy to use front panel control for all the main operations. HR-35's back panel allows either centronics parallel or RS-232C serial interface connection. DIP switches are easy to access and attachable options such as the tractor feeder and cut sheet feeder offer increased utility. And it goes without saying that the HR-35 uses exclusive **brother** daisywheel cassettes and ribbon cassette systems for simpler, mess-less changes. **brother** HR-35, a high output printer.

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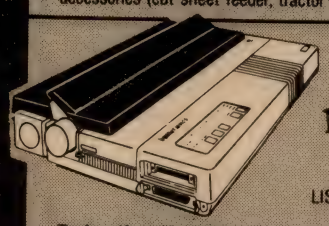

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The **brother** M-1509 is a dot matrix printer designed to offer reliability, economy, and quiet, easy operation to users of personal or small business computers. Normal print speed is a fast 180 cps (pica), but the M-1509 also provides handsome Near Letter Quality printing at 45 cps. A variety of character sets are available, and the high-density bit image capability produces impressive graphics.

The M-1509 also incorporates a number of cost- and labor-saving features. The large memory buffer releases the computer for other tasks while printing, an optional cut sheet feeder reduces paper-handling time, and the one-inch paper cut function economizes on paper. In addition, the M-1509 is supplied with character sets and control codes compatible with those of the IBM PC and the Epson FX series printers, for easy interfacing with a broad range of computer equipment.

Above all, the M-1509 is designed for people. It is exceptionally slim and light, with conveniently consolidated controls, allowing it to fit easily into a fully-equipped work station without wasting either office space or valuable operator time. It is also quiet – a fact which, though often overlooked, is of crucial importance in maintaining an efficient, industrious office environment.

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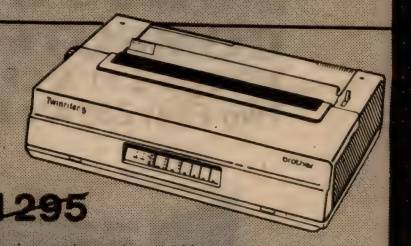

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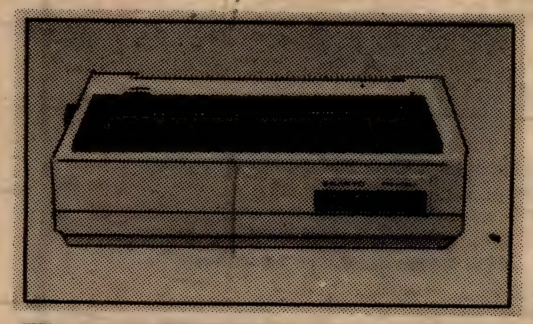

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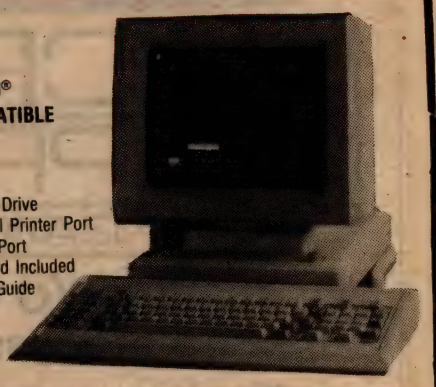

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- ITT Xtra Keyboard Included
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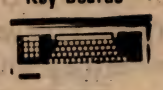

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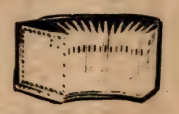

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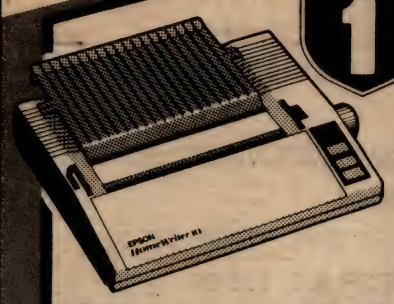

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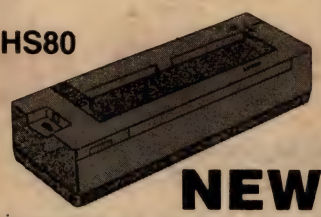

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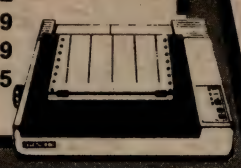

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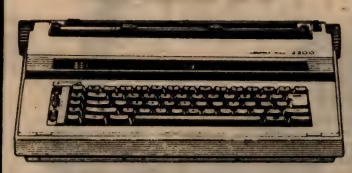

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- M80 (L80, LIB80, CREF80)
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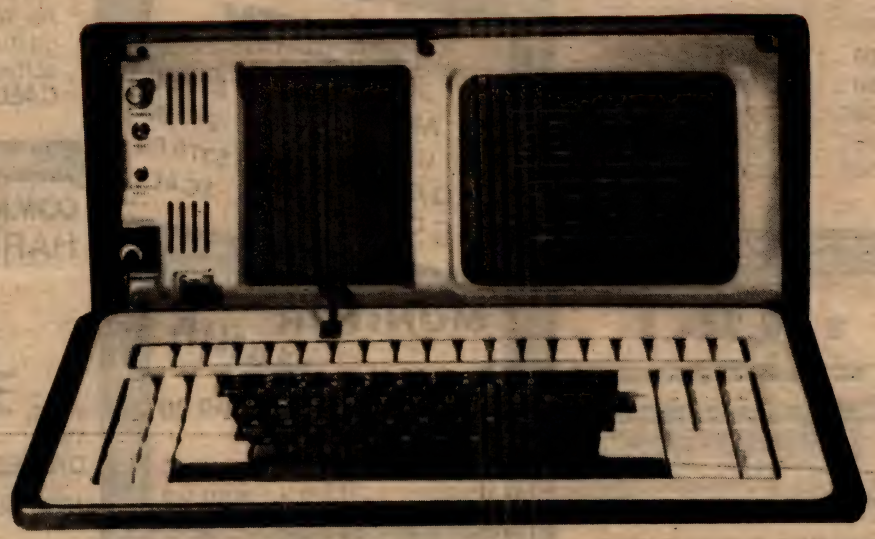
- DATA COMMUNICATIONS SETUP PACKAGE
- SERIAL & PARALLEL PRINTER PORT
- DATA COMMUNICATION PORT



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ZORBA is the lowest cost full featured portable computer. This light weight computer is ruggedly packaged in a convenient carrying case. The case surrounds a strong inner chassis which further protects the Z80A based computer with its two double sided double density disk 400K drives, large easy to read 9'' display screen and well designed detachable keyboard.

ZORBA uses CP/M, the industry standard operating system, which means that a wide range of existing software is readily available to the user.

The ZORBA users manual covers operation of the unit, all supplied software and all interface and internal information. A system diskette is supplied with all system files and utilities. A second diskette contains the sources for all ZORBA software including BIOS, SETUP, FORMAT, and PATCH.

Keyboard

Keyboard communicates serially with CPU
Detachable with 2 foot coiled cord
95 keys in standard QWERTY format
13 Key Numeric pad
Independent Caps Lock and Shift Lock
55 Software programmable function keys
All keys auto-repeat after 1 second delay
All Standard cursor and terminal control keys

Disk System

Controller:	WD1793
Drives:	5.25 Double Sided, Double Density, 400K 48 TPI

Built-in disk interchange formats: Xerox 820 (SD, DD), Kaycomp (DD), DEC VT-180 (SD), Osborne (SD) and IBM-PC (eg. CPM/86) and Televideo 802 (Read/Write and Format compatibility) (Expandable to 82 Formats)

Specifications
General Mechanical and Electrical

Width	-17.5 inches (44.45 cm)
Height	- 9.0 inches (22.86 cm)
Depth	-16.0 inches (40.64 cm)
Weight	-24.6 pounds (11.1 Kg)
Power	-80-130 VAC or 190-245 VAC 50/60 Hz 170 watts max

Display

Display Tube:
9'' diagonal, Green or Amber
High resolution display circuitry
60 Hz refresh rate

Display Format:
25 lines x 80 columns
5x7 Character Font with full descenders
128 ASCII Characters
8x9 32 Characters Graphic Font
2K Memory Mapped Display Buffer

CPU Board

Z80A CPU running at 4 Mhz with no wait states
64K bytes of 150 ns RAM (58K after CP/M loaded)
16K bytes of EPROM (2732) can be switched in and out by software 12K available for user EPROMS
8275 CRT controller, DMA driven
1793 Floppy disk controller, SMC data separator
Bipolar proms configure 10 addresses
Fully structured interrupts prioritized by bipolar proms

Interfaces

- Full asynchronous RS232 port with modem control. Baud rates and data translation and protocol programmable
- Full asynchronous full duplex RS232 port with hardware handshake (for printers). Baud rates and protocol programmable. (Serial Printer Port)
- One 8 Bit parallel port with independent strobe and ready lines. Supports Centronics interface with an available adaptor cable.
- IEEE 488 Bus Master Port (ie: General Purpose Instrumentation Bus) not Software Supported.
- 21 Standard Software Programmable Baud Rates: 45.5 to 19,200 BPS

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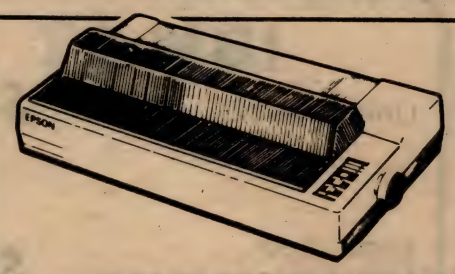

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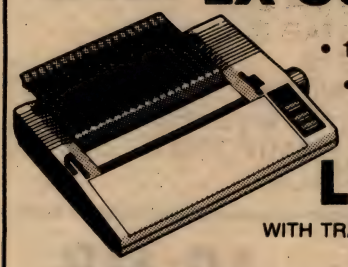

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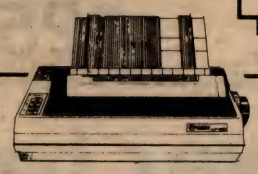

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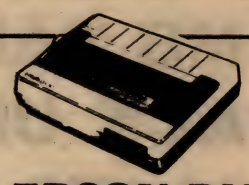

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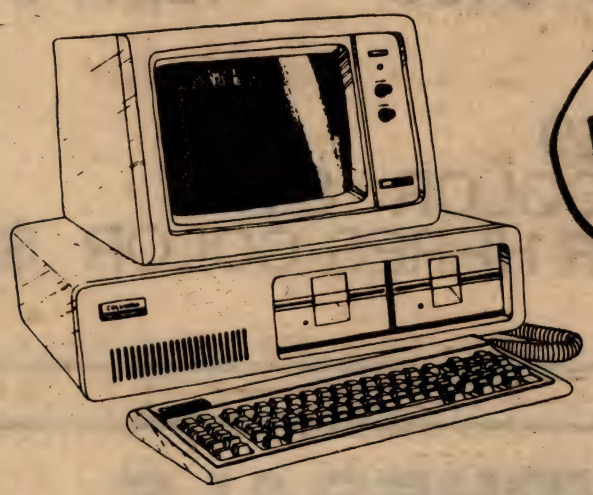

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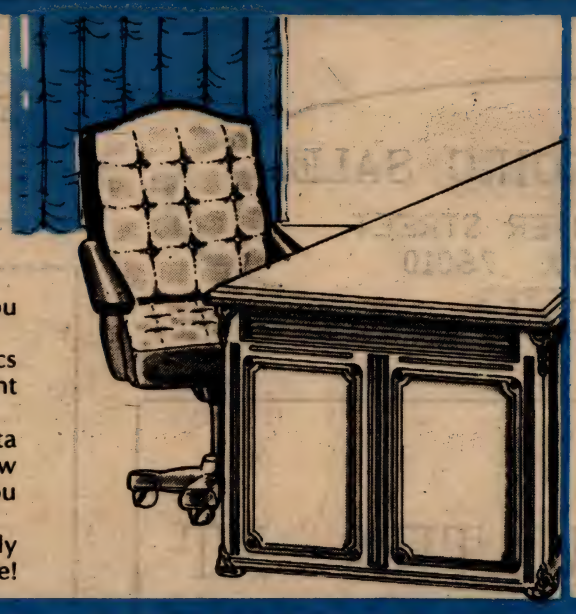

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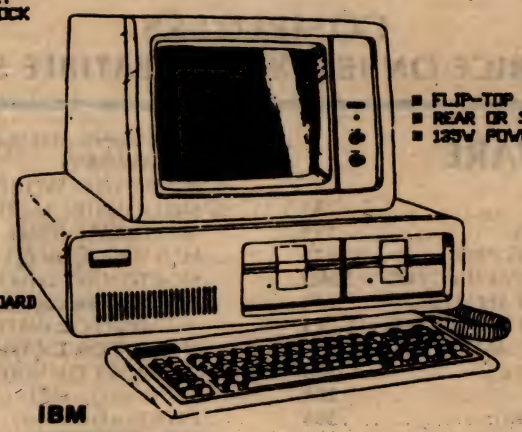

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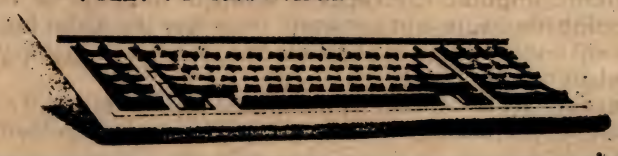

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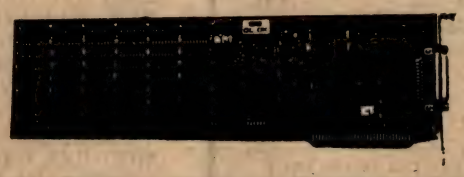

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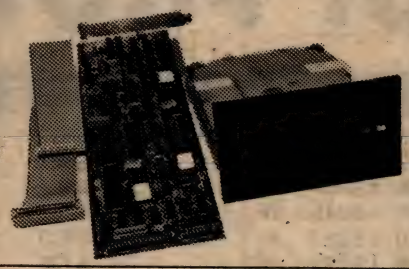

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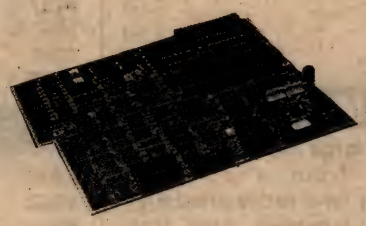

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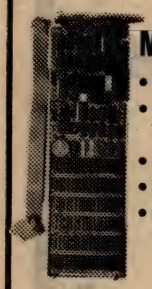

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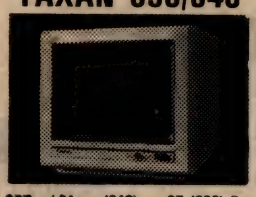

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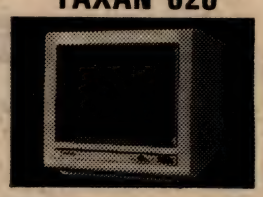

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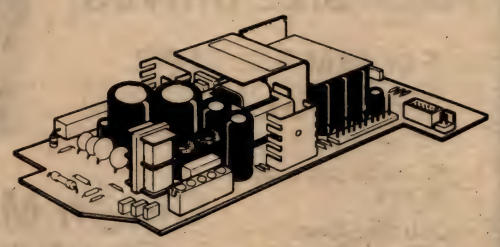

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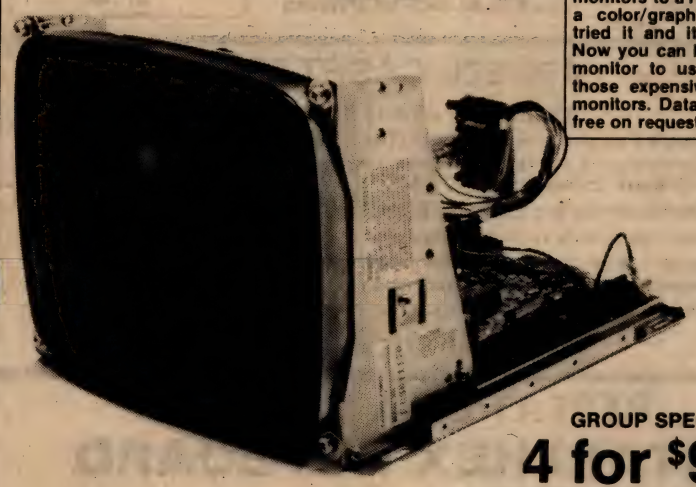

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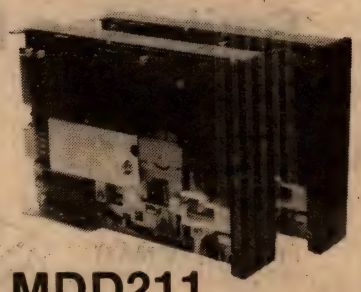

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ATARI MODEM BOARD

Apparently manufactured for Atari by Raycal-Vadic. P.C Board #81219-903 Rev. D. These are complete factory finished modem boards with all parts except the 8048 (8748) C.P.U. chip, for which there is a socket. Includes the popular T.I. TMS99532 modem chip which is socketed. This T.I. chip alone lists for as much as $29.95 at some of our competitiors. These are factory new boards with all connectors, switches, relay, etc., but are sold as is —no warranty or data. Super limited quantity.

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8048 For Above Board
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We bought 5 skids of these casettes. Titles include: *Touch Typing, Invitation to Programming I & II, Hangman, Introduction to Sound, Blackjack, Juggles House, Juggles Rainbow, Introduction to Graphics, States and Capitals, European Countries and Capitals, Scram and Writing Programs Two.* These are a very high quality recording tape and may be recorded over for excellent reproduction. Most come in casette holders. Sorry, no choice on titles. Super good assortment (some duplications when necessary). Most C-60. May be last chance to obtain these.

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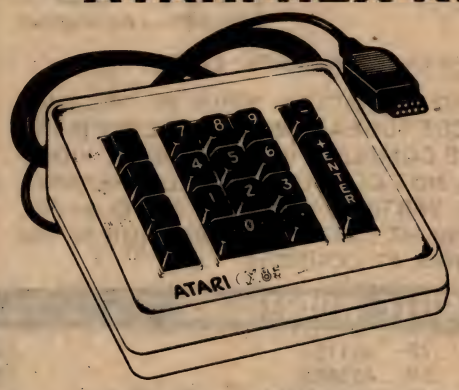

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Originally designed for use with an Atari Home Computer. Brand new in box. Encoded using the popular National Semi 74C923. Full schematic included. Originally sold for many times our price. Many applications besides computer use.

"TALKERS"

SPEECH SYNTHESIS TECHNOLOGY AT SURPLUS PRICES!

We were recently fortunate to purchase a small lot of surplus computer boards that incorporate the very latest in high quality human speech synthesis.

This two board set was the heart of a blood analysis system designed for use by blind diabetics. This unique device was conceived by one of the world's leaders in computer blood systems. Apparently no expense was spared in either the research, design, or fabrication of this computer.

The board sets we are offering are NOT complete blood analysis systems and are sold only for the speech synthesis circuitry they contain. A powerful motorola 68705 U3L single chip processor controlled the blood analysis unit. This processor also interfaces to the General Instruments two chip speech set which includes a SPO256-AL2 (28 pins) and a SPROOO (40 pins).

The GI SPO256 contains 59 addressable allophones and 5 pauses which may be strung together to produce any English word. The SPROOO allows expansion to the external EPROM (27128) for storage of the desired vocabulary. The SPO256 also has a vocal tract model, 16K ROM, ALU, handshake control, pulse width modulator, 12 holding registers, and 5 interpolation registers all in one 28 pin package! This high density chip design allows for a complete voice system that requires only a few parts to be complete.

By adding only one resistor, the units can be put into a "Test" mode to demonstrate the internal vocabulary. This board set has been selling like crazy at surplus stores in both Dallas and Houston. We have, however, set aside a limited number of these boards for sale to our special mail order customers. One resourceful customer in Houston even had one of these "Talkers" connected to his personal computer doing random speech!

These devices were powered by a regulated 9VDC 1 Amp power supply. We have luckily acquired a FEW of the supplies, and are selling them for $6.95 each when purchased WITH the Talkers. The DC supply is a totally self contained affair that is rated for only 10 mv ripple at the output. DC supply when purchased separately is $12.95.

We are also offering the GI set separately (new, unused parts) for $9.95. Remember: this is for BOTH chips. Radio Shack sells the SPO256 alone for $12.95!! Our stock on the new chip pairs is limited, please order early to avoid being left out. Sure, the completed Talker units are a better deal, but you still might want to purchase an extra chip set for a spare.

For the real hardware hackers we have a few of the blank PC board sets to the Talkers for $4 (both boards).

We include full schematics of the Talkers, GI speech chip set data, and "Test" instructions, with every shipment. Note: issue #29 of Analog Computing (P.O. Box 615 Holmes, PA 19043) has a very detailed article on using the SPO256 with a personal computer.

Due to the limited number of Talkers in stock, we advise early ordering.

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Add $3 Shipping in USA, Canada: add $6 (For Talker and supply)

Radio Shack tm of Tandy Corp.

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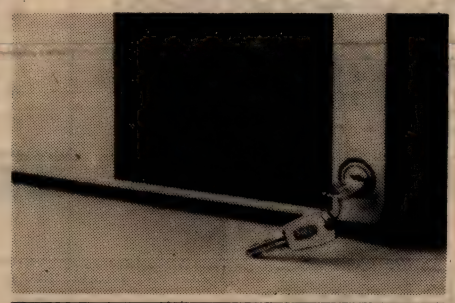

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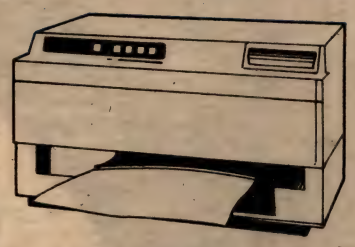

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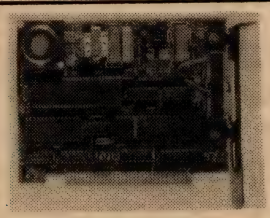

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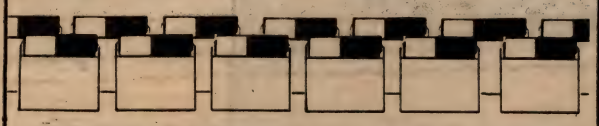

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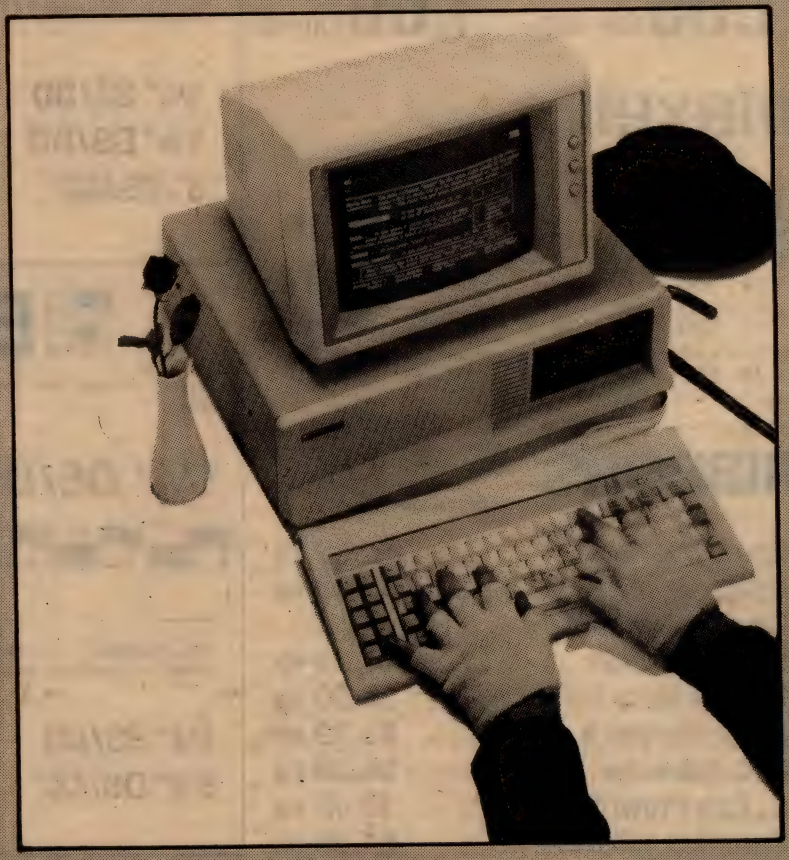

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ANSA's Paradox: The New Standard

by John McMullen

Last September 23rd, Ansa Corporation introduced its long rumored "PARADOX" data base system for the IBM-PC and compatibles. The introduction in New York City was hosted by Benjamin M. Rosen, Chairman of the Board of Ansa and a principal in the venture capital firm of Sevin-Rosen Management Corporation which bankrolled Ansa and previously was instrumental in bringing Lotus Development Corporation and Compaq Computer into existence.

Since that introduction, Paradox has been one of the most talked about products in the marketplace with interest being focused not only on the technical performance of the product but also on the more elusive questions concerning the ability of any new product to obtain a meaningful portion of an already crowded market. While this article is concerned primarily with the functionality of Paradox, it is well to remember that the marketing-related questions may ultimately be the determining factors in the success or failure of any product. It is our opinion, based both on the prior success of Sevin-Rosen backed products and on the amount of press and industry attention that the product has received since its announcement, that Paradox will receive enough "shelve-space" and make the proper in-roads into Fortune 500 companies to obtain a fair chance to succeed. It will then stand or fall on its own merits.

Design Strategy

Paradox is based on the "Query By Example" metaphor made famous in computer science circles by Moishe Zloof of IBM's Thomas J. Watson Yorktown Heights Research Center in 1975. This process greatly simplifies the method of obtaining information from data base files and, more importantly, of relating one file to another.

The publicity surrounding Paradox also refers to the use of "Artificial Intelligence" in the program. To those who understand "artificial intelligence" as being either "expert systems," "robotics" or "natural language" processors, the use of the term in relation to Paradox will appear to be, at the best, misleading or, at the worst, deceptive. Actually, it is neither. There is buried deeply within the program elements of AI that "optimize" the querying process.

The program uses the familiar "1-2-3" type user interface which displays menu choices across the top of the screen and allows the left and right cursor arrows to move from choice to choice. When the cursor moves to a menu choice, the choice is highlighted in reverse video and a message describing the choice is displayed on the lien under the menu. The choice may be selected either by moving the cursor to the choice and depressing the "Enter" key or by depressing the first letter of the choice (Ex. "V" when "View" is desired. Note: this method is usable for all menus that are contained within Paradox; it may also be used for user defined menus if the user is careful to ensure that menu choices do not have the same first letter (Ex. "Process" and "Print" in the menu). The use of the "Lotus-like" menu makes the system easily recognizable to the experienced "1-2-3" or "Symphony" user.

The similarity to "1-2-3"-type programs does not end with Paradox's menu formats. Data files are, by default, displayed in a spreadsheet-like format that will be familiar to spreadsheet users and the user may move around the data file in the same manner that he/she moves around in "1-2-3." Data may be changed in this mode by toggling the "EDIT" key (F9) and typing over the existing field values.

As a further aid to Lotus users, ANSA provides a booklet, *A Quick Guide to Paradox for Lotus Users* with the system (it also provides a similar document for dBase users). The concern shown by Ansa in making the system attractive to existing "1-2-3" users points out what Ansa obviously feels is its primary market place--the manager or professional engaged in decision support activities; the power of the system, as well as the suggested retail price of $695.00, make it most attractive to the so-called "power user" who can really put the system to work.

In spite of the relatively high price, Ansa touts Paradox as a product that is competitive across the complete range of file management and data base products; a system that will do battle with the PFS line at the low end because of its ease of use and with the data base programming languages such as dBase III and Rbase 5000 at the high end because of its great power. To attract users of these other systems, Ansa has provided within Paradox (through utilization of the "EXPORTIMPORT" choice of the "TOOLSmenu) the ability to import and export data to and from "1-2-3," "Symphony," "dBase II & III," "PFS," "Visicalc's DIF" format and standard ASCII files (none exists at this time for Rbase files). The conversion is an intelligent conversion in that, wherever possible, it makes use of the file definition contained within the other system's files. The conversion of dBase files to Paradox format is extremely fast and impressively smooth, rivaled only by the dBase--Framework link (where both products are from the same publisher, Ashton-Tate). The recent release of Lotus "1-2-3" Version 2 has complicated the "1-2-3" interface as the ".WK1" format of the Version 2 files is not compatible with the ".WKS" format of Version 1, 1A & 1A*. To convert these files to and from Paradox, it is necessary to use the "Translate" program contained in "1-2-3" Version 2 and reformat the ".Wk1" files to a ".WKS" format. Sources at Ansa have assured us that Version 2 of Paradox will contain interfacing capabilities to ".WK1" files (Ansa publicly committed, on the announcement date of the product, to a true multi-user Version 2. It is this version that will contain the additional "1-2-3" interface as well as other improvements. There is no official release date for this version.)

Let's Use The Product

The design goals of Ansa would mean little to us if the program did not perform well--and perform well, it does. To explore the power of the system, we need only to develop an application in Paradox. As experienced dBase users, we find the system quite easy to get into once we understand that "TABLE" in Paradox's lingo is simply a "File" in dBases and that the two most important keys in the system tend to be the F10 or "MENU" key which, when pressed, brings the appropriate menu or or sub-menu to the screen and the F2 or "DO_IT!" key which causes the execution of whatever activity has just been defined. (ex. Querying, Reporting, Script editing, etc.)

To define a new file, we choose the "Create" option from the main menu and, when presented with a definition form and an explanation of field types, simply fill in field name and type. The available Paradox field types are Alphanumeric (dBase's "Character" type) and Numeric (with and without decimals) as well as specially

continued on page 100

Paradox — Database a la Lotus

by Andrew M. Fried

Introduction

For many years, the Dbase series of relational database managers has not only cornered the market but in many ways defined the market. Continuing its dominance from the CP/M world into the PC-DOS world, dBase has continued to dominate the database manager just as Lotus has dominated the electronic spread sheet market.

Now, there is a new database program that rivals dBase III for speed and power. Armed with financial backing from the same group that backed Lotus and Compaq, a company named Ansa has introduced an extraordinary relational database called Paradox.

Opening the Box

The Paradox package could be sold by the pound and profits at Ansa would still be high. Inside the three inch box containing the Paradox program are three manuals and two pamphlets.

The first thing that caught my eye when I opened the box was a little pamphlet entitled, "A Quick Guide to Paradox for dBase Users." This handy little reference guide lists most of the dBase commands and shows the equivalent Paradox commands.

One interesting and novel feature of Paradox is that, in addition to supporting a standard data import/export capability, Paradox can work directly with several programs proprietary file format. dBase is included in this list. This means that you can have a dBase II or dBase III file and directly load it into a Paradox application or send a Paradox file into a dBase application! More on that a little later.

As you may have guessed, the second pamphlet is entitled, "A Quick Guide to Paradox for Lotus Users." This pamphlet lists the Lotus commands that are translatable to Paradox commands and their counterparts. It also discusses a feature of Paradox called Scripts which are very similar to the Lotus macro capability.

The first manual is called "Introduction" (bet you can't guess what it does, huh!). This manual, consisting of 150 pages, provides an insight into all of the features of Paradox; a tutorial of sorts. It explains the different terms, applications and features of Paradox while stepping the user through a tutorial.

The next manual is the "Users Guide." This four hundred page manual embraces all of the keyboard designations, illustrates each of the menus, discusses different data structures and their significance and goes into great detail in discussing all of Paradox's features. It is arranged in sections resembling the screens enabling you to quickly locate information on any command anywhere in the program.

For those interested in programming, the third manual, entitled the PAL Users Guide, contains an additional 250

continued on page 54

PC\FLIST Review

by Ken Fermoyle

No more typing DIR, DIR B:/W or DIR C:/P to check lists of files. No more hammering the keyboard to spell out COPY C:\Filename.Ext A: or TYPE A: Filename.Ext. A new utility program and productivity aid written by programmers William G. Nolde and Harold J. Shields, PC\FLIST, frees you from all that.

It serves up neat, informative screen display listings of files from given disks, directories or subdirectories (Figure 1) — then lets you manipulate those files in all sorts of ways.

```
                                AVAILABLE SPACE =    1024  TOTAL SPACE =   362496
                                                                 20 OF        47
DIRECTORY FOR B:\*.*
 NAME     TYPE                        PC\FLIST          TIME      DATE        SIZE
--------------------------------------------------------------------------------
IBMBIO    COM                                          12:00p  10-20-83     4736
IBMDOS    COM                                          12:00p  10-20-83    17024
COMMAND   COM                                          12:03p  11-10-83    15957
KEYCODES  EDX                                          10:45a   2-10-84     3072
EDIX      EXE                                          11:50a   3-09-84    68475
LSN       EDX                                           9:17a   2-13-84    17920
STUDENT   BAT                                           5:11p   4-15-83       15
GRADUATE  BAT                                           5:16p   4-15-83      287
LSNCFG    EDX                                           4:26p   4-18-83      455
TEXT                                                   12:00a   5-18-82     1671
HELP      EDX                                          10:34a   2-10-84    14848
CONFIG    EDX                                           1:44p   2-10-84      512
EXELOAD   EXE                                           1:38p   3-01-84     1676
README    1ST                                          11:55a   7-22-83     3261
HYPHDICT  WDX                                           2:24p  10-22-82     4297
                                                       11:24a  10-21-82      479
TESTPRT   WDX                                           2:58p  10-21-82      424
TEMPLATE  WDX                                           2:43p   7-30-83    77824
WORDIX    EXE                                          12:01p   7-22-83     3965
SAMPLE    WDX                                          11:50a   7-30-83    36352
WPEXEC    ETC
F1=HELP  F2=USER F3=END F4=USER F5=NAME F6=EXT  F7=BACK F8=FWRD F9=DATE F10=SIZE
```

```
                                AVAILABLE SPACE =    1024  TOTAL SPACE =   362496
                                                                 40 OF        47
DIRECTORY FOR B:\*.*
 NAME     TYPE                        PC\FLIST          TIME      DATE        SIZE
--------------------------------------------------------------------------------
HELP      WDX                                          10:32a   7-22-83     6249
PRINTER   WDX                                          12:00p   3-08-84     3475
WP        BAT                                          12:38p  12-07-83       24
DEFAULT   DVC                                          12:04a   1-01-80       53
SETBAUD   BAS                                          11:24a  10-21-82      464
SETPRT    BAT                                          11:24a  10-21-82       40
MEMO      WDX                                           4:31p   4-22-83     6931
RESETPRT  BAT                                           4:29p  10-22-82       18
RESUME    WDX                                           2:35p  12-17-82      311
COPYLBL   WDX                                          11:59a  12-31-82     1492
LETTER    WDX                                           3:17p   7-07-83     3316
COMMANDS                                                8:59a   1-11-83      461
EPSONFX   DVC                                           3:12a  10-04-84       97
COPROCES  ART                                           4:45p   5-19-85     1536
WRPFONT1  FFI                                          11:44a   8-18-85      512
TSTFILE   DOC  Copy A                                   8:05p   8-23-85      512
TSTFILEJ  DOC                                           3:22a   8-24-85      512
LEGONAIR  FRM                                          11:10a   8-24-85     1024
NEWSLTR   AUG                                           9:50p   8-28-85     5632
NEWSLTR   ^UG                                          10:31p   8-26-85     3584
F1=HELP  F2=USER F3=END F4=USER F5=NAME F6=EXT  F7=BACK F8=FWRD F9=DATE F10=SIZE
```

Some of you might find, as I did, that PC\FLIST reminds you a bit of a more sophisticated, expanded version of the public domain utility, NSWEEP. It helps you do a lot of the same things, only more so, and adds new goodies.

You can copy files from one disk or directory to another, for example, by typing COPY (plus directory or disk designation) next to the filename. Same goes for such commands as DEL or ERASE and EDLIN. (See Figure 2). You can even run COM, EXE or BAT files directly from the PC\FLIST screen display merely by typing EXEC next to their names — with a filename, if one is required.

Or you can make it even easier by using predefined function keys. Hitting ALT/F2 is the same as typing COPY A: and ALT/F1 is like typing the EDLIN command.

Sound good? Well, PC\FLIST *is* good. And looks good, too. Screen displays are well thought out, easy to read and understand. The color system layouts are especially attractive, with a menu of 128 color combinations readily available to let you select new colors whenever you want.

Moreover, the program doesn't cost an arm and a leg — either in money or memory. Price is just $29.95, and the program essentials (NULL, FL and BROWSE) occupy about 19K. Two additional commands, FKEY and BKEY, take up 17K each.

To use PC\FLIST you simply type FL (plus the drive\path designation, if different from the one you're in) at the prompt and hit <return>. A display of the first 20 programs on the desired disk or directory appears on your monitor. A line at the upper left corner identifies the drive, directory or subdirectory being displayed, as shown in the figures. You can go to this line to change the drive/directory you want displayed at any time by pressing the HOME key.

Note that the time and date each file was created, and its size, are shown in right-hand columns. The top line shows total disk/directory capacity and remaining space available for use.

Directly under that is a line that tells you how many files are in the directory and which currently are being displayed. In the figures this line reads "20 of 47," which means that the first 20 files of a total of 47 on that disk/directory are displayed below. If you press F8 to bring up the next set of 20 files the message changes to "40 of 47," meaning that files 21 to 40 are now displayed. And so forth, until you cover the entire directory. You can scroll back through the directory, 20 files at a time, by pressing the F7 key.

The center space between the filename, extension and time columns is the command line area. The active file line, on which you type commands, is highlighted and marked by the cursor.

A list of function keys and their uses runs across the bottom of the screen: F1 calls for Help, F3 takes you out of PC\FLIST, F7 and F8 scroll you back and forward through the directory, etc.

It's possible to use various combinations of search parameters to call up selected lists of files. Asterisks <*> and question marks <?> can be used as "wild cards" for filenames and extensions or characters just as in MS-DOS commands. Here are some examples, with commands you enter underlined, and list of files called up in parentheses:

C> **FL*.EXE** (EXE files in directory)

C> **FL FLIST** (files in FLIST subdirectory)

C> **FL R*.COM** (COM files that begin with R in current directory)

C>**FL B:*** (files without an extension on drive B)

C>**FL WP????.*** (six-character files beginning with WP followed by any four characters and any extension)

Copying and erasing more than one file at a time can be done by typing the equal sign <=> next to additional files you want to duplicate or eliminate.

As mentioned above, predefined function keys can be used to make such chores even easier. A list of default function key assignments is shown in Figure 3.

continued on page 96

```
                PC\FLIST HELP SCREEN                          1 of 2
              USER-DEFINED FUNCTION KEYS
          USE THE PROGRAM FKEY TO CHANGE THEM

ALT/F1   EDLIN
ALT/F2   COPY A:
ALT/F3   COPY B:
ALT/F4   COPY C:
ALT/F5   COPY D:
ALT/F6   COPY E:
ALT/F7   *
ALT/F8   *
ALT/F9   EXEC
ALT/F10  =

F2       BROWSE
F4       FL


                PRESS SPACE BAR FOR MORE HELP,
           PRESS ANY OTHER KEY TO RETURN TO MAIN MENU
```

```
              PC\FLIST HELP SCREEN                            2 of 2

  F1       HELP
  F2       USER DEFINED KEY
  F3       END PC\FLIST
  F4       USER DEFINED KEY
  F5       SORT BY NAME
  F6       SORT BY EXTENSION
  F7       PAGE BACKWARD
  F8       PAGE FORWARD
  F9       SORT BY DATE AND TIME
  F10      SORT BY SIZE

  CTRL-Q              ADD DIRECTORY TO SEARCH STRING
  CTRL-W              BACK UP ONE LEVEL IN THE SEARCH STRING
  CTRL-F              UPDATE THE CURRENT DIRECTORY LISTING
  CTRL-D              ENTER ANY PROGRAM NAME AND PARAMETERS WITHOUT EXITING
  CTRL-Z              GET SUBDIRECTORY SPACE
  TAB OR             MOVE TO BEGINNING OF NEXT LINE
MOVE TO BEGINNING OF PREVIOUS LINE
  =                   REPEAT THE LAST COMMAND
  HOME                MOVE TO TOP TO CHANGE SEARCH

            PRESS ANY KEY TO CONTINUE
```

Database a la Lotus
continued from page 53

pages of information covering the Paradox Application Language. Also included in the manual are plenty of examples to get the fledgling programmer up and running before dinner.

If, after reading 800 pages or so, you still don't understand Paradox, I strongly urge you to consider a roladex...

If, in describing the voluminous amount of documentation, you get the feeling that this program is so complicated it needs all this, you're wrong. Paradox is so simple to operate that most would be able to insert the disk and run with the program without ever having looked at the documentation. Lets take a brief look at the various menu choices and what each module does.

System Requirements

Paradox requires either an IBM PC, IBM XT, IBM AT, Compaq Portable, Compaq Plus, Compaq Deskpro or other "100% PC compatible" computer equipped with a whopping 512K of RAM and running under DOS 2.0 or higher. If you had a RAM disk before Paradox, you probably won't afterwards!

While 512K sounds like a large amount of memory, Paradox uses this to manipulate data in memory as much as possible increasing its operating speed.

While Paradox can be run on a floppy disk based system, a hard disk is highly advisable as the disk swapping necessary to run Paradox becomes quite annoying. The actual program files take up approximately 750K of disk space, however Ansa recommends that an additional one megabyte remains free to support complex queries. If you don't have the hard disk, you will need two floppys and a lot of patience.

Other equipment supported by Paradox includes a color or monochrome monitor, and a printer.

Paradox Specs

Paradox features a complete Lotus like interface enabling any yuppie to fully master the program between backgammon games - a claim dBase can hardly make. But don't let the menu driven characteristic fool you; there is no sacrifice in power. A single Paradox data base can contain up to 260,000,000 bytes of information in up to 65,000 records. This means that each record may contain as many as 4000 characters.

Each record in Paradox may contain up to 255 fields, and each field may contain a maximum of 255 characters per field.

Installation

Paradox is distributed on copy protected diskettes which not only acts to drastically increase the disk space required for the program but also makes installation more difficult. I personally refuse to "install" copy protected software onto my hard disk; an attitude I gained after one of these schemes caused my hard disk to regurgitate its data all over my fat table.

Paradox contains batch files to assist you in setting up the diskette or hard drive according to your equipment specifications. I chose to manually install all of the files into a subdirectory on the hard disk and install the actual copy protected program onto a floppy. While I can run the program from the hard disk, the installed version on the diskette must

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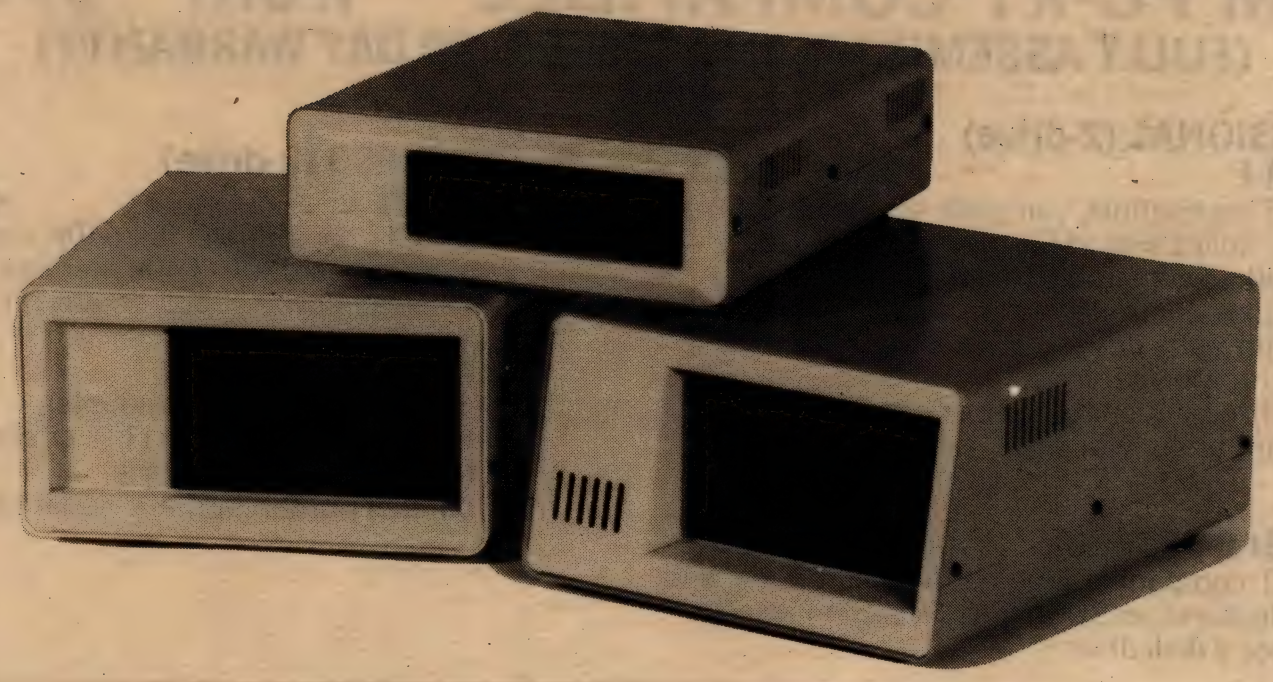
ENCLOSURE SOLUTIONS



If you are searching for disk or tape packaging alternatives, consider the Microware product line:

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SYSTEM FEATURES INCLUDE:

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6. monochrome monitor (TTL or composite),
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IBM PC-XT compatible, true portable computer with:
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2. one floppy disk drive.

HARDWARE FOR IBM PC/XT

1. EasyData modems (Hayes command compatible):

a. EasyData 1200L (full size internal modem) $195
internal modem card for IBM PC/XT/AT and compatibles, state-of-the-art design, auto-dial and auto-answer, call progress monitoring, adaptive dialing, auto redial on busy, additional serial port, free PC-TALK.

b. EasyData 1200H (half size internal modem) $249
half size internal modem card for IBM Portable and PC/XT/AT and compatibles, same features as 1200L but without additional serial port.

c. EasyData 1200D (external stand alone modem) .. $219
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2. HARD DISK SYSTEMS:

a. internal 10MB hard disk drive with controller $495

b. internal 20MB hard disk drive with controller $595

3. TAPE BACKUP SYSTEM (20Mb) $695

4. FLOPPY DISK DRIVE (TEAC 55BV) ..... $ 95

5. MONITORS:

a. monochrome TTL, 12", green ..... $ 99

b. monochrome TTL, 12", amber $105

c. color monitor, 14" $375

6. PRINTERS
Citizen's near-letter-quality printers

a. MSP-10FT, 160 cps (80 col.) $309

b. MSP-15FT, 160 cps (132 col.) $449

c. MSP-20FT, 200 cps (80 col.) $449

d. MSP-25FT, 200 cps (132 col.) $619

7. ADD-ON CARDS:

a. 256K multi-function card (MUL-256) ..... $ 95
256K memory expansion, clock/calendar, printer port, serial port

b. 384K multi-function card (MUL-384) $119
384K memory expansion, clock/calendar, printer port, game port

c. Multi-I/O card (IOC-880) ..... $ 95
floppy disk drive controller (for 2 drives), clock calendar, printer port, serial port

d. Monochrome card (MNC-880) ..... $ 75
IBM compatible, mono display 80X25 characters

e. Monochrome graphic printer card (MGP-880) .... $ 90
720X348 resolution, Hercules compatible, printer port

f. Color graphic card (CGA-880) ..... $ 80
80X25 characters, color 320X200 res, monochrome 640X200 res

g. Color graphic printer card (CGP-880) ..... $ 99
same features as CGA-880 plus printer port

h. Memory expansion cards:
Expandable to 256K (RAM-256) ..... $ 40
Expandable to 512K (RAM-512) ..... $ 60

i. Printer parallel card (PTC-880) ..... $ 23

j. Serial cards:
Single port (RSC-880) ..... $ 35
Double port (RSC-990) ..... $ 50

k. Joy stick card (JSC-880) ..... $ 20

l. Joy stick (JS-880) ..... $ 20

m. Keyboard for IBM PC (KBO-880) ..... $ 79

n. 135 watt power supply for IBM PC-XT (PSY-880) . $ 85

o. Case (metal chassis) for IBM PC-XT (CAS-880) ... $ 65

p. 640K PC-XT mother board, 0K (PCB-550) $175

q. Floppy disk control card (FDC-880) .. $ 49

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APPLE

Ask The Guru

by Don Lancaster

There's lots of exciting new Laserwriter developments this month. Firstoff, Apple has slashed the list price of the Laserwriter by $1000 to a new $5995.

But, even this figure is totally meaningless since the street price is around $4300 if you shop around and find a hungry enough dealer.

I have even heard of a "lowball" Laserwriter offer of $2600 when the printer was bundled with a Mac, a hard disk, and a CAD package. But you should beware of prices that are a thousand dollars under dealer cost. The chances are pretty good that they will find some way to make it up somehow.

And guess who pays.

All of which means that there is now virtually no cost advantage to the gutless imitation Laserwriters that are chronically unable to give you full page graphics, can not handle large type sizes, and do not have a powerful and standard typesetting language built in.

Speaking of which, Adobe Systems, the *Postscript* people now have two excellent books available. These texts largely replace the older and hard to get *Inside Laserwriter* manual.

Addison Weseley publishes both of them. These are the *Postscript Reference Manual* and the *Postscript Tutorial and Cookbook*. Check these out at your local bookstore or call their free 800 number.

The Laserwriter also made *Infoworld's* product of the year award. By the way, if you ever want to keep something a secret, be sure to stay out of their "review responses" column. My demo pack letter there on November 5th, 1985, has pulled thousands of requests so far.

There are also lots of new fonts in the works. These are available from quite a few different sources. As I'll show you someday, it's a simple matter to build your own custom fonts. Many of the stock "printshop" packages are also quickly picking up a full Laserwriter compatibility.

There are also rumors of a new ROM set for the Laserwriter that will give you 42 standard fonts in a stock format that can be accessed from any word processor on just about any computer. More on this when I get full details.

Some disk-based fonts are also newly available directly from Adobe, but unfortunately these are not viable products as they now stand.

Why?

Because of three nearly fatal flaws. First, these new fonts are priced at $175 for a related set of four. This is twenty times what comparable fonts are worth today and ten times what the market will bear.

The perceived value of a font in a personal computer environment is 99 cents, as set by any number of popular "printshop" packages that offer you fifty fonts for $49.95.

Besides that, any idiot with a cheat book can steal Laserwriter fonts quickly and simply. With only slightly more smarts, at the same time, he can also dramatically compact those same fonts.

Because of their current perceived value, the days of licensable type fonts are over. Sorry about that, but that's the way things are today.

Secondly, there are some half-assed and totally inane protection schemes that were added to both the disks and to the fonts themselves. These severely penalize the honest user, while strongly rewarding the dishonest one. Such useless protection schemes and the thinking behind them have no place whatsover in personal computing, let alone in today's personal publishing.

Thirdly, these fonts are intended for Macintosh use. Right now, the Apple IIe or IIc is a far better choice as a Laserwriter driver. This is mostly because of the crippling limitations of much of today's Macintosh software. There's also the present forced Macintosh use of the slow and highly restrictive AppleTalk access mode.

These disk based fonts will become a major product only when and if they are dropped to a $19.95 retail level, are totally deprotected, and are offered for computers that are genuinely useful as Laserwriter drivers.

As a reminder, even after the Infoword onslaught, I still have a few Laserwriter demo packs remaining. Write or call if you are interested in getting a free copy.

Just be sure to get in ahead of the hoarders. Let's move on...

How Can I Translate Programs Or Text Between Computers?

The task of moving things between different brands of computers can range from trivially easy to virtually impossible.

There are two main steps involved in translating a program from one make and model of a computer to another. The first step is to move the actual image of the program or text file over to the second machine. The second step is to modify that image so it will run in its new home.

Step one is surprisingly simple. To move *anything* from one personal computer to another, just convert that anything to a disk-based textfile and then send that file over a serial interface to the second machine. Often, serial RS232 communications at 1200 baud is a good choice, using standard printer or modem utility software. This will result in a literal and exact transfer of the text from the first machine to the second.

Note that there are no machine limitations at all involved with this technique, so long as each machine has enough memory to receive the file, and so long as the handshaking on the serial channel works. The brand of micropro-

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RS-232 Cables For The Macintosh And Apple IIe

by Philip Chien

One of the big mysteries of 1984 is the IIc and Macintosh serial connectors. Why did Apple Computer abandon paralel interfaces, and why were substandard connectors used? Eliminating parallel interfaces was probably caused by FCC radiation regulations. It's much easier to control the RFI from the three or four wires used by serial devices than the ten to thirty used by eight bit parallel ports. In addition all devices (modems, printers, I/O interfaces, tape punches, etc.) are available in serial versions, but nobody (so far) has designed a parallel modem. If you want to standardize your product line, then you better pick serial. The standard connector for RS-232 serial communications is the DB-25 connector. DB-25 connectors are popular, relatively inexpensive, and commonly available. Unfortunately, they are also relatively large (4cm x 1cm). Normally this isn't a problem, but when you need to fit two serial connectors, a disk drive port, and a mouse port on the back of a computer the size of a Macintosh, there just isn't enough room for DB-25 connectors. So Apple decided to use DB-9 connectors instead. Most serial communications only require five wires, and the four extra pins were designated for the Appletalk network. On the Apple IIc, Appletalk isn't available, so only five wires are needed. DIN connectors have one more advantage over DB connectors. DB connectors usually require a screwdriver to attach and detach. But although DIN connectors can be installed and removed by hand, keep a good electrical and mechanical connection when needed. Since the IIc was designed for home and portable use, Apple decided to use DIN connectors on the Apple IIc. Apple set its own in-house standards that printers would use DB-25 connectors, modems would use DB-9 connectors, and each computer would use whichever connector was better suited for the environment the computer was designed for. The particular advantage to this is that modem eliminators are not needed. As long as Apple stocks all of the cable combinations needed (DB-9 to DB-25, DB-9 to DB-9, DIN 5 to DB-9, DIN 5 to DB-25, etc.), it is very difficult (although not impossible) to plug in cables incorrectly. Another advantage, which the marketing department likes, is that the user must buy Apple equipment in order to get the proper connections.

Must you? The Apple Modem is a fairly generic Hayes Smartmodem compatible modem. Apple Computer doesn't even build it (it's OEMed from US Robotics). Many users (especially me) would rather use a more powerful, and possibly less expensive modem. Many manufacturers sell modem cables for the Macintosh and Apple IIc. But if you can't find a pre-wired cable, want to save some money, or just want to wire your own cable, it's quite simple to wire your own cable if you can use a soldering iron.

DIN 5, DB-9 and DB-25 connectors are all stock items in Radio Shack stores and electronic houses, so all of the parts can be easily obtained through local electronics stores.

If You Have A Macintosh

Parts Needed: DB-9 Male connector and hood; DB-25 Male connector and hood; about 1 meter (3 feet) 4 conductor cable.

The four conductor cable is not critical. I've used phone wire cable without any problems. If you need, the cable can be extended to as much as sixteen meters (50 feet) without any problems. Before you start soldering, examine the DB connectors very closely. The pin numbers are impressed into the plastic insulator of the connector, but the numbers are usually quite small, and you may need a magnifying glass to examine them. Make sure you know which solder cups you are going to solder before you make any mistakes and solder a wire to the wrong connector. Solder the connectors as shown in diagram 1. Various modems require that lines 6, 8, and 20 be tied together to handshake properly with the Macintosh. Be very careful when soldering the wires to the DB connectors, the solder cups are fairly close together, and it is easy to make

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Ask The Guru
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cessor and the operating system does not matter in the least.

In the case of a program written in a higher level language, it is usually far better to transfer a textfile copy of the *listing* of the program to the other machine, rather than transmitting the program itself. The reason for this is that the parsing and interpretation of the program may differ wildly between the two machines.

The new ProDOS operating system on the Apple IIe easily and instantly lets you change the type of any file to or from a textfile. This is done using, of all things, the TYPE command. For instance, to change a machine language binary file or program to a textfile, first load that program into your IIc or IIe.

The do a CREATE TXT. MINE,TTXT, followed by a BSAVE TXT.MINE,A$2000,E$39F6, TTXT. The starting and ending address will change with the position and length of your program.

To convert your BASIC program to a textfile on disk, just write a short header to your program that opens a textfile, lists that program to the textfile, and then closes the file.

To get *from* a textfile listing a BASIC program, just EXEC the textfile. Unless the program is up to something very strange, the program will first run and then will leave you with a listing in the machine. This listing can then be saved as an Applesloth file.

So, moving either text program images or text program files between one machine and another is more or less trivial, once you get the details worked out.

Getting the code to work in its new home is another matter entirely. Some languages, such as Pascal, will end up more or less machine independent. Other languages such as BASIC, will be pretty much compatible, so long as the same dialect of BASIC is in use at both ends.

Should each machine use a different dialect of BASIC, the chances are that most of the commands will carry over. The usual way to debug things is to run the program until it blows up and then find the specific command that is causing the problem. Fix the commands one at a time until your program works.

PEEK and POKE commands will have to be rearranged to suit the new machine. In many cases, you will have totally different ways of using PEEKs and POKEs. In particular, the graphics and sound mechanics will differ wildly from machine to machine.

In general, the more sophisticated and the more elegant the program, the more hassles you will have when translating. To get around these problems, you may have to become a *very* knowledgeable machine language hacker in *both* the old and the new machines.

What Is Post Processing?

A magic technique called *post processing* lets you add custom features to your word processor, literally letting you leap tall buildings in a single bound. Such things as user friendly interaction, a wall-to-wall microjustify, HIRES or other graphics dumps, and just about any special feature you can dream up can be accommodated.

Best of all, use of post processing does not normally require any machine language smarts, nor any custom patches to the word processor of your choice. This solves a crucial dilemma I have had on the helpline when I get a request for a patch that does a very special task for an oddball printer or an off brand printer card.

Post processing works on any word processor that lets you print a *fully formatted* text image directly to disk. While Applewriter is ideal for this sort of thing, any processor that lets you print to disk will allow post processing.

What you do with post processing is first print to disk. Then you later use the disk image and further modify it, depending on what you are trying to do.

In some cases, you run the disk image back through the same word processor. In others, you can use Applesloth or some other higher level language to make certain changes before your final printing.

Let's look at a dozen examples of post processing. This will give you an idea of how general and how powerful this little-known technique is.

(1) To improve the appearance of a daisywheel printer, you can "double whap" each character, thus printing everything bold. Just print to disk and then get the disk image back. Now, search and replace each carriage return with a carriage return followed by a "print everything bold" command, and you are home free.

(2) Some of the dot matrix printers will continue their underlining of the right margin or the next left margin every now and then. To cure this, print to disk, reload the new image, put a "no underline" command at the end of the problem line, and then print.

(3) To change a daisywheel in mid-line for italics or whatever, print to disk. Then read the disk image with Applesloth, looking for some key markers. If no marker is found, one line at a time is printed. If a marker is found, the appropriate prompt is given the user to change the wheels.

(4) Sometimes you may want to print on two wildly different brands of printer or even on both a printer and a typesetter. To do this, do a print to disk using generic commands. Then read the disk image and search/replace the generic commands with the exact ones for the printer in use.

(5) To get between two word processors having wildly differing commands, print to disk first. This strips off all imbedded commands of the first word processor, leaving you with a pure text image. Then read that image with the second word processor.

(6) Headers and footers can be customized beyond the limits of the word processor by repeated trips to disk. To do a triple header, print to disk two lines shy, including the bottom header line. Then reprint to disk one line shy, adding the middle header line. Finally, print to paper while adding the top header line.

(7) Even and odd pagination can be picked up by printing first to disk and then doing a search/replace on every second header.

(8) HIRES dumps or other graphics images are handled by putting markers into your text and then printing to disk. You then read the disk a line at a time with Applesloth. When the marker comes up, you stop the printing and start doing a graphics dump. When the picture or graph is finished, you pick up the proper printing in the proper position and continue with your text.

(9) A full proportionally spaced wall to wall microjustification can be added to most modern printers by initially printing to disk. Then the disk is read by a suitable routine that counts the individual widths of each character in the line. After that, each and every space on that line is uniformly widened just enough to force the text between left and right margins. When you do this, be sure to *not* justify leading spaces or else your paragraphs will end up ratty.

(10) For printers that already have microjustification ready to go, a trip to disk lets you insert those special commands only at print time, so they stay out of your textfiles except when needed.

(11) Lists can be sorted and numbers can be totaled by grabbing them just before their final printing and rearranging their order.

(12) Daisywheels with "funny" spokes can be recoded so they will print properly, again by printing to disk and then doing a search and replace with the desired commands.

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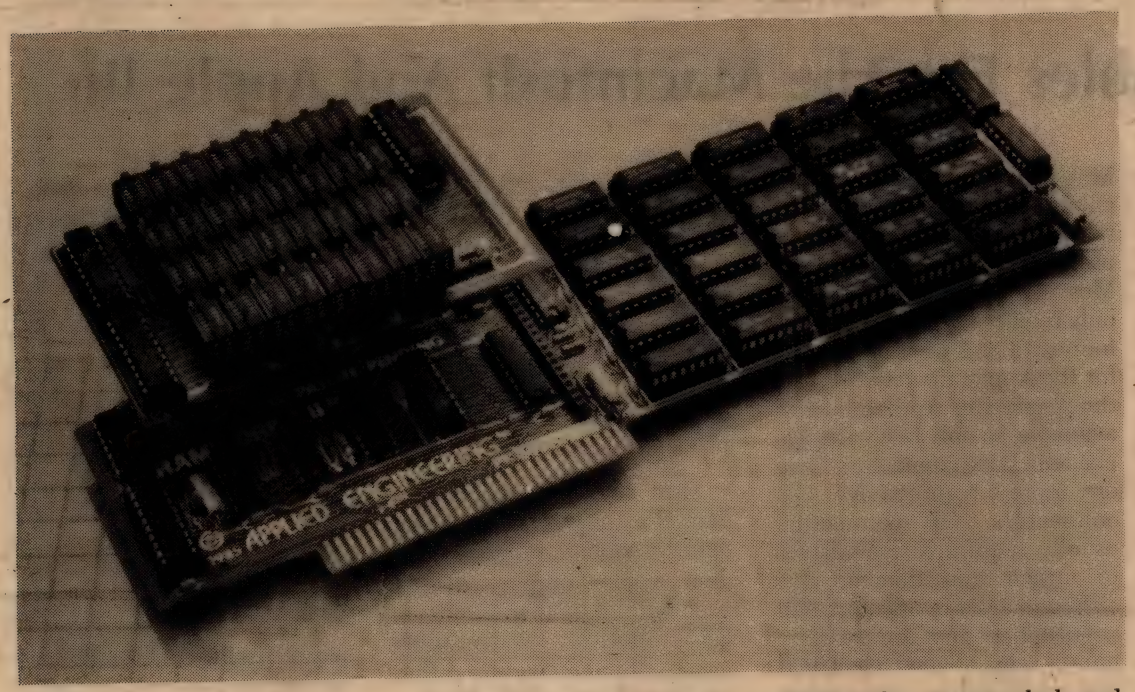
Three Meg Memory Expansion Card For The Apple IIe



Need more memory for your Apple? You can add three million bytes of additional random access memory to your Apple IIe with a Ramworks II board from Applied Engineering of Dallas.

A piggyback board, less than half the size of the Ramworks II main board, holds twice the amount of memory. The piggyback board contains 64 256K-bit dynamic RAM chips in small inline packages. The three-megabyte Ramworks II sells for $1699. A one-megabyte Ramworks II without the piggyback board is $389.

Ramworks II increases the size of the Apple IIe memory by 4140%, producing a "desktop" message that reads "2,277K avail." for users of the best-selling Appleworks program.

In addition, Ramworks II provides users with a built-in 64K printer buffer which allows use of the Apple while long documents are being printed.

The piggyback board can be used with Applied Engineering's earlier Ramworks board. Applied Engineering was the first manufacturer to increase Appleworks dekstop. Its 128K Memorymaster board was introduced in April 1984, the same time Appleworks was put on the market. More than 100,000 Ramworks have been sold since its introduction last January.

For more information, contact Applied Engineering, 214-241-6060, or write P.O. Box 798, Carrollton, TX 75006.

Mention that you read about it in *Computer Shopper*. ●

MACINTOSH

Macintosh At Comdex

by L.J. Kutten

Between November 20th and 24th, Comdex, the world's largest computer show held its annual get together in Las Vegas. With over 1,250 companies displaying products to over 90,000 attendees, every type of conceivable computer product was being demonstrated in the hope of catching someone's eyes. Products ranged from five-cent parts to computers costing hundred of thousands of dollars.

Compared to previous Comdex shows, this show was boring. Unlike last year, there were no long lines at any of the booths. In fact, it appeared that the longest line at the show were people waiting outside the Las Vegas Convention Center at 5:00 p.m. for taxicabs.

Gone were the flashy booths, revolutionary product announcements, and big press receptions. The entire affair was sedate and clearly demonstrated that at least some of the dust had settled in the microcomputer arena. The new technology that was introduced was not American. It seems the Japanese have taken over technological innovation. A prime example is the Write Once Read Mostly ROM (WORM) cartridges. All the products displayed, even those claiming to be American, were based on either the Panasonic or Hitachi-Maxell technology.

Very noticable were the companies that did not appear. These included Lotus Development Corp., Peachtree Software Inc., 3Com, and Infocom.

What may be a harbinger of things to come in trade shows was the large amount of booth sharings. Many large companies shared their booth with smaller companies. Both the Apple and Atari booths are prime examples. Both were filled with representatives from smaller software and hardware companies showing off their Apple or Atari-related products. As booth sharing lowers the amount of profit earned by the show sponsor, however only the booth owner was allowed to put their press kits in the press room.

Apple At Comdex

Apple had a massive booth at Comdex. It was so large that Apple printed map booklets to help attendees find their way around the display area. Major areas of interest included Desktop Publishing, Business Information, Vertical Markets, Education, Development Tools, Business Management, Business Productivity and Home Productivity. In fact, there were so many companies other than Apple exhibiting their wares that it was difficult to find anyone from Apple in the booth to talk to.

Macintosh At Comdex

Outside of the Apple booth, it appears that Comdex has turned into an IBM show. Three days of cruising the aisles, press kit room, and press conferences resulted in a pile of Macintosh applicable press kits and announcements that would not even fill one airline flight bag. What follows are descriptions of some of the products a Macintosh user may see in the months to come.

The Most Interesting Product

In this writer's opinion the most interesting Macintosh product shown was a commodities and stock quote system shown by Booneville Telecommunications. Composed of three parts, MacMonitor, MacStock, and MacInvestor, an investor is provided with capabilities of having a real-time overview of the commodities and stock markets. Using a sideband FM frequency Bonneville Telecommunications broadcasts encrypted date over the airwaves in major metropolitan areas. In the event a user does not live in an area covered by Booneville, a private satellite dish is necesary. When recieved by Booneville's data receivers, the signal is de-encrypted and translated into signals useable by the Macintosh. Among the information available to the commodities investor are real-time quotes selected by the user, including high, low, new change, and the previous two ticks. The bottom of the screen displays news headlines which can be expanded to the complete text at the click of a mouse. Charts and graphs can be displayed on up to 20 contracts which can be sized and placed according to the user's wishes and updated periodically as prices change.

Available stock information includes stock options from all American exchanges, up and down market alerts, and pull down menus. All information can be charted and 50 pages of news storage is available.

Booneville is attempting to market this package to individual investors whose investment portfolios exceed $100,000 because the system is not cheap. Besides paying $225 for the software, a user will have to pay a minimum monthly data charge of $145 plus any fees charged by the exchanges. Markets covered by the system include the New York Stock Exchange, the American Stock Exchange, NASDAQ Over the Counter, Stock Options, Chicago Board of Trade, Chicago Mercantile Exchange, Commodities Exchange Center, and the Kansas City Board of Trade.

New Macintosh Hardware

A number of companies have released trackballs to replace the ubiquitous mouse. This included the Quad μLYNX trackball by Honeywell. Available to OEMs (original equipment manufacturers) for $129 in quantities of one, Honeywell hopes to garner a significant amount of the mouse replacement business. When I asked what companies were actually using this device, the Honeywell representative declined to answer.

A different variation on the trackball was shown by Assimilation. The Numeric Turbo device combines a full scale keypad with a trackball. Besides numbers the keypad portion contains function keys for addition, subtraction, multiplication, and division. According to Assimilation, data entry with this device is 50% faster than using a mouse and the Apple Keypad. The unit is available now for $149. If you already own the Assimilation Mac Turbo Touch, a plain trackball, upgrades to the Numeric Turbo are available.

For those interested in music, Assimilation also showed a MIDI Conductor. This is a Musical Instrument Digital Interface that allows the Macintosh, with proper software to connect to MIDI equipped devices. This included instruments by such companies as Yamaha, Sequential, Roland, Korg, all Casio keyboards, and the entire E-Mu

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MacUniverse

by L.J. Kutten

This column marks a milestone for MacUniverse. It is now one year old. Over the past year, your Universe Master has tried to both entertain and educate you. As a birthday resolution, I promise to strive to improve this column in every way possible.

Mail

As part of my goal to improve this column, I would like to hear from you and know what you are thinking. The Macintosh world has grown so big so fast there is no way I can keep on top of everything that is happening. If you think there is a particularly good product that should be publicized or a bad product that others should be warned about, let me know and I will investigate. Write me at Universe Master, *Computer Shopper*, P.O. Box F, Titusville, Florida 32781. If you have access to either Compuserve or the Source, send me electronic mail. My Compuserve ID number is 70655,376 and my Source ID is CPA108. I will try to answer every letter.

Rumor Control

The November 26th issue of Compuserve's *On-Line Today Magazine* printed an article it calls a "MACBOMBSHELL." It claims that Apple will cancel future developments on the Macintosh operating system and replace it with a specially-designed implementation of UNIX, the multi-user operating system designed by ATT. This is happening because Apple intends to release three highly specialized machines network capable of working in a network environment. Interestingly enough when the message was posted on Compuserve's Macintosh SIG, a high Apple executive did not come out and deny it; rather he made a joke about it. That in itself indicates there may be some validity to it. While your Universe Master thinks it is highly unlikely that Apple will cancel the Macintosh, stranger things have happened in the microcomputer marketplace. If Apple does cancel the Macintosh operating system, the current line of Macintoshes will quickly become "orphan" machines. It is an mistakable fact of life in this industry that the minute a microcomputer is cancelled, software development for it ceases. You can be sure that your Universe Master will try and track this rumor down.

Editor's Note: I do not believe this rumor and have reason to believe that it is false.

Objectivity

Last November I attended the COMDEX show in Las Vegas. This is the big annual get together of the computer industry. Over 1250 companies displayed their wares spread over 300,000 square feet of floor space. While there I had the pleasure of meeting some of you. The predominant theme of the questions asked me dealt with my objectivity in writing MacUniverse. Often I was asked if anyone, other than myself, controls the content of the column or modify what I say about any particular product. I want you all to know the answer is a resounding "NO!" One of the nicer aspects of writing for *Computer Shopper* is that I have control over this column. Unlike some magazines I have written for, the editor has never killed a review or even toned down my comments about a product. Under no circumstances does the advertising department dictate what is said about a particular product. When a company sends a product in for review,

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BatteryPak Review

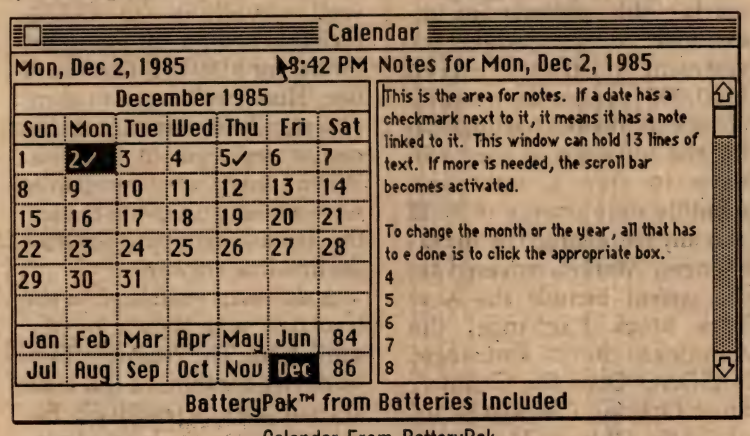
by L.J. Kutten

BatteryPak is a collection of eight desk accessories and two related application programs published by Batteries Unlimited. Functional on either a 128K and 512K Macintosh, these desk accessories will help the average user better manage his or her daily life, while at the same time enabling Macintosh to perform more productively by enhancing its operational speed and making certain tasks easier to execute. The accessories include a calendar, a 250 page phone pad with autodialer, a RPM (reverse polish notation) calculator, a scientific calculator, a five function disk utility, an ASCII file printer, a program launcher that bypasses the desktop, and a utility to control the various windows on the desktop.

Calendar: The "Calendar" desk accessory is a perpetual calendar that displays a month at a time. Next to the Calendar is an area to write notes and appointments. Any day with a note linked to it has a checkmark next to it. To add a note to a specific date within a month only requires a click on the date and typing away. There is no limit as to note size. Similarly both month and year are changed by a click. Included with the accessory is search feature. Merely activate the FIND command key in the text string you want to find. All the data files scanning the calendar are then searched and can easily be displayed.

In order to access the calendar data in a easier fashion, the program Calendar Manager is included. It allows the user to print out notes from the Calendar from any range of dates. Unlike the Print Text desk accessory, this program is compatible with the Laserwriter. The user can print out the data his or her choice of fonts and font sizes. If an Imagewriter II is available, the 50% reduction mode can be used.

Print Text: Print Text allows the background printing of text files. Among the options available are (1) stating the number of spaces a tab character represents, (2) whether a header should be printed on each page, (3) whether the printout should be in compressed mode, and (4) whether to automatically print sequential line numbers before every line. The only limitation with Print Text is that it is incompatible with the Laserwriter.


Calendar
Mon, Dec 2, 1985
8:42 PM
Notes for Mon, Dec 2, 1985
December 1985
Sun Mon Tue Wed Thu Fri Sat
1 2✓ 3 4 5✓ 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
Jan Feb Mar Apr May Jun 84
Jul Aug Sep Oct Nov Dec 86
This is the area for notes. If a date has a checkmark next to it, it means it has a note linked to it. This window can hold 13 lines of text. If more is needed, the scroll bar becomes activated.
To change the month or the year, all that has to e done is to click the appropriate box.
4
5
6
7
8
BatteryPak™ from Batteries Included
Calendar From BatteryPak

DiskTools: DiskTools allows the user to perform three file functions from within any application. It allows the user to copy, rename, or trash a file. Additionally it will display file attributes indicating type of file, its creator, file size, date of creation, and date of last modification.

Windows: The Window accessory prevents loss of windows by bringing any window to the front of the screen. Merely select the window title from a menu and it is automatically brought forward as if you had clicked on it with the mouse.

Phone Pad: "Phone Pad" is everything that the Note Pad desk accessory that came with the Macintosh should have been. First and most importantly, instead of the measly 8 pages found in Note Pad it is a humongous 250 pages. Adding to its versatility is (1) the ability to go to a particular page, (2) search for text, and (3) an autodial capability with a Hayes compatible modem.

Not discussed in the documentation is the ability to hide text in Phone Pad. Merely fill up the visible page with inconsequential data. At the end of the page paste in the material you want to hide. Phone Pad's search will not find it. Of course if you forget what page you hide it on, you will have to manually search for it.

In order to easily access the Phone Pad data, the program Print Phone Pad is included. It will print selected pages from the Phone Pad similar to how they appear on the screen. The program typically fits 6 Phone Pad pages on a 8½ body 11 page. Printing is 50% reduction mode on an Imagewriter II will put 25 pages on a single sheet.

Launcher: This desk accessory is a mini-finder that lets the user jump from one application to another without returning to the desktop. It is similar to other mini-finders

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MacEnhancer Provides Access to HP LaserJet and Print Scaling Capability

Microsoft Corporation recently announced Version 2.0 of the Microsoft® MacEnhancer™ expansion system for the Apple® Macintosh™. The new release is designed to support many printers including the Hewlett-Packard LaserJet printer, and other dot matrix printers. Microsoft has also added software that provides a scaling function to support the correct sizing of graphic and text output on different printers, regardless of their resolution.

"The MacEnhancer is the most versatile device for supporting multiple peripherals on the Apple Macintosh," said Bill Roland, Vice President of Microsoft's Hardware Division, "This new printer support will increase its appeal to business and professional users."

The Microsoft MacEnhancer expands the Macintosh by providing three additional ports--one IBM-compatible parallel port for parallel printers, and two IBM-compatible serial ports for serial printers, modems, or host connections. These three additional ports are provided without losing either of the two existing ports.

Microsoft Word and MacEnhancer First Macintosh Products to Support LaserJet

The MacEnhancer is designed to counter the Macintosh's limited ability to drive different printers. By using Microsoft Word on the MacEnhancer and the HP LaserJet, the Macintosh can now generate near-typeset quality output at an affordable price.

The MacEnhancer provides support for all of the HP LaserJet font cartridges. In addition, Microsoft makes it easy to integrate new cartridges into the system. With the MacEnhancer, Microsoft is the only company to provide support for both the Apple LaserWriter and HP LaserJet printers on the Apple Macintosh. Microsoft has also added support for the IBM® ProPrinter and Epson® LX-80™ series with Version 2.0.

When using Word and the LaserJet, the user indicates which fonts and which sizes are available using a standard Macintosh dialog box to enter font cartridge label. MacEnhancer even provides default values for the most common cartridges and allows you to save the values for the cartridges that you use most often. The MacEnhancer picks the font(s) that best match the characteristics of the document being printed. Even bold, italic, superscript, and subscript are supported.

"With its unique font selection dialogue box, the MacEnhancer provides unparalleled flexibility in defining the frequently used fonts for all the different cartridges that are available for the Hewlett-Packard LaserJet," said Charles E. Ulfers, Marketing Manager for Hewlett-Packard's Boise Division.

The new scaling software feature allows the user to alter output of the Macintosh to allow for the different resolution of all the printers that the device supports. The MacEnhancer has a default setting that automatically adjusts the output so it is consistent with what is on the screen. The user can also change it to suit their preferences.

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New Internal Disk Drive For Apple's Macintosh Computer

General Computer Co. recently introduced HyperDrive 20, the company's second internal hard-disk drive for Apple's Macintosh. The announcement was made at the MacWorld Expo.

HyperDrive 20, a 20-megabyte hard-disk drive, doubles the storage capacity of the HyperDrive, which was introduced last winter. Tests conducted by independent organizations have consistently shown that HyperDrive loads and starts software programs nearly twice as fast as any external hard-disk drive.

John Ison, director of marketing, said, "Both HyperDrive 20 and HyperDrive were developed for serious computer users who are attracted to the Macintosh because of its powerful graphics capabilities and effortless operating system."

Included in this group are owners of small businesses who use the Macintosh to help run their operations; managers in mid- to large-size businesses who use sophisticated business software or operate a Macintosh network; and software developers who are looking for additional storage capacity and speed.

"In addition to offering the highest performance Macintosh hard-disk drive, General Computer's overall philosophy has been to differentiate its disk products from the rest of the market by adding sophisticated system software that complements the disk operation," said Ison.

HyperDrive 20, which stores up to 50 Macintosh floppy disks, includes four disk-management utility programs: Manager, Security, Disk Backup and Print Spooler.

Accompanying Software

The Manager utility enables users to divide the hard disk into 32 file drawers (each appearing as a separate icon on the Macintosh screen), as well as to assign a password to each file drawer. This utility allows users to organize disks more efficiently, for example, by plac-

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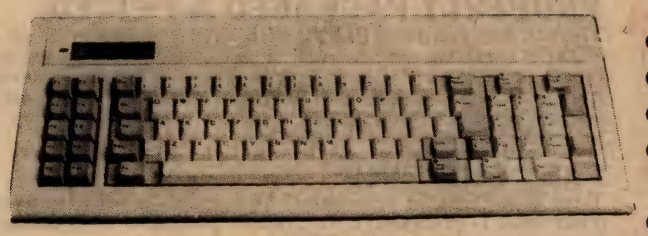

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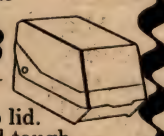

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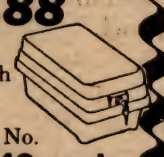

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COMMODORE

Fall Comdex Wrap-up

by Cheryl Peterson

The overall feeling of this year's Fall Comdex Show seemed to be optimistic. Most of the people I spoke with reported having a "good show," with lots of interest being shown in the products offered. In a last minute trip around the convention center floor on Sunday, I asked those who remained if they had done well and all reported they were satisfied with their showing.

Rather than go into a long winded monologue about the show, I'll give you quick looks at some of the more interesting products and events I ran into.

Microsoft "Roasts" Windows

After almost three years of media hype, programming delays, delivery date extensions and corporate embarrassment, Microsoft Corp. has finally unveiled *Windows*, an operating environment created to improve and extend the capabilities of all IBM PC computers. In a well designed media event at the Alexis Park Hotel in Las Vegas, November 20, Microsoft announced the availability of *Windows*.

This could have turned out to be the most "ho-hum" press conference at the '85 Comdex, however Microsoft invited several industry leaders to take their best shots at both the corporation and *Windows*. John Dvorak, irascible columnist for InfoWorld and "Don Rickles of the microcomputer industry," emceed the "roasting" and managed to insult everyone on the panel.

All in good fun, John Roach, president, chairman of the board and CEO of Tandy Corporation, pointed out Tandy's complete faith in *Windows* by mentioning that Tandy had already designed (and discontinued) a computer engineered to make full use of *Windows*.

Complete with slides showing magazine magazine covers, articles, press releases and letters, the cast of *"Windows Roast"* pointed out every flaw of marketing possible. From Esther Dyson's coining the term "vaporware" for *Windows'* benefit to Stewart Alsop II's Vaporware Hot List, they didn't miss a sordid detail. Stewart Alsop II, former editor of *InfoWorld*, presented Bill Gates, president of Microsoft, with an award for longest time spent on the VaporWare Hot List and coined a new phrase, "Vapor Lock."

Gates took it all in stride and finally rose to say that *Windows* had arrived. A videotape version of a session using *Windows* showed some of the more popular business packages running in multiple versions with six windows visible simultaneously. And to prove that *Windows* is no longer vaporware, sample copies were given out to media representatives present.

Softsel Announces Award Winners

Softsel, one of the largest distributors of computer software, announced its Best Seller award winners at a press conference. Borland International products took three awards; Best Selling Product, Best Selling System and Utility Software and Best Selling Desktop Accessory. Best Selling Recreational Software went to Flight Simulator II from SubLogic. The Most Titles in the Top 10 Award went to InfoCom for the third year in a row.

Hardware awards went to Amdek, AST and CH Products. Amdek received the Best Selling Peripheral award for its Video 310A monitor. AST received the award for Best Selling Component for its Six Pack Plus add-on board for IBM and compatible computers. Best Selling Accessory went to Mach III from CH Products.

Adam Osborne Announces VP-Base

Adam Osborne, head of Paperback Software, Inc., announced VP-Base, a database manager which he claims is a "superset of dBase III" capable of reading and using dBase II and III files. "We are not trying for total compatibility with dBase III which is a bug-ridden moving target," he said.

Saying that the product was aimed at IBM PC and compatible users, Osborne promised immediate delivery to corporate customers. He said that because of the similar (though not indentical) command structure, users familiar with dBase would not need the extensive documentation being prepared for the mass market release.

After citing an impressive list of database management features, Osborne said the program was suitable for a multi-user environment. He emphasized Paperback Software's site licensing policy under which diskette and documentation can be purchased at reduced prices. In the case of VP-Base, the site license price is $40 per copy--less than half the suggested list price of $99.95. Software purchased under site licensing contains no copy protection. For multi-user systems, Paperback Software requests customers buy one copy per terminal. Though single-user versions are protected, a non-protected version can be bought for an additional $10 if a license agreement is signed.

Osborne promised delivery of VP-Base to Waldenbooks, B. Dalton, other book stores and mass market outlets in April. When questioned about the relationship between direct-to-corporation sales and sales in book stores, Osborne commented "The book stores have been and will continue to be a major source of our sales."

Osborne noted that the Paperback Software cancelled the upgrade of VP-Planner, its Lotus 1-2-3 clone, to conform to Lotus' version 2. "We are no longer telling corporations that we are coming out with a completely (Lotus 1-2-3) compatible version of VP-Planner. Instead, we will upgrade those features which are in high demand."

Claiming discontent among corporate users with the file compatibility level between 1-2-3 versions 1 and 2, Lotus' upgrade price and copy protection, Osborne said, "We expected to have an uphill battle because we aren't Lotus and instead I feel like we have a downhill run because we aren't Lotus."

Tecmar Announces New Leadership And Products

Dr. Martin Alpert, president of Tecmar, Inc. announced the restructuring of the company's management at a press breakfast. Claiming that the company had grown beyond the size of a family business, Alpert said that he and his wife, Carolyn, had organized a professional management team to help run the company. Members of the staff include Raymond Rosewall, director of business management; Richard Dorman, vice president of marketing; John F. Purner, vice president of sales; Michael L. Nargi Jr., chief operating officer and executive vice presi-

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Inside Commodore

by Ted Drude

If you've ever monkeyed around with a ML monitor, you've probably been intrigued by the relocation commands; transfer and relocate. If you've wondered how to use that capability in "real life," you'll get your chance this month. We're going to use the ML relocator to move our parallel printer driver program around, so those of you who don't want to have to reassemble the program can put it where you want it. There's also some general computer scuttlebutt and tirades.

Hard Disk Project Update

Last month I mentioned that we hadn't gotten a lot of mail in response to a possible hard disk for the C-64/128. Well, I spoke prematurely! Since I wrote that, there has been a flood of mail in positive favor of it. I don't have anything new to report on the hard disk project yet, but you can be sure that you'll be hearing more as soon as there is something presentable.

Right now some technical details (like funding) have got us bogged down. I hate to keep stringing this out, but I will let you know as soon as we get something in presentable form. Until then, I'll try not to talk about it (but I'm as excited as most of you are).

Correspondence: Thanks for Writing!

I want to say a big "Thank You" to all who've been writing us with your comments, suggestions, and ideas. Since I put out a "call for letters" over a year ago, there has been a steady stream of mail coming. It has been a big help in guiding us as we plan articles ahead, and keeps us on track with our readers interests. Due to the volume of mail, and the lack of staff on my end, I will no longer be able to directly reply to your letters, unless you also include a stamped-self-addressed envelope (SASE) when you write. I assure you that all of your mail gets read by me (and usually saved for future reference) whether you are asking for a response or not. If I don't respond directly, there's still a fair chance that your letter will end up in this column. But I really need your help in providing a SASE if you want a reply direct from me. Please keep writing! We need your input.

Address your correspondence to:

Ted Drude
c/o *The Computer Shopper*
P.O. Box F
Titusville, FL 32781

If you are writing to request the parallel printer driver program disk, there is a new address to send it to:

Ted Drude
2808 Redwood Lane
Waterloo, IA 50703
Attention: Disk Offer

(The disk is $5.00 postpaid or send stamped-self-addressed mailer, your disk, and $2.00)

Also, be aware that the *Computer Shopper* is now making reprints of all past articles available (starting with the November '85 issue). The reprints will be high quality 8x10 format for $3.50 postpaid. So if you need or want a reprint of any past articles from November on, you can now order them direct from the *Shopper*.

Memory Problems: Where's the Shoehorn?

Here's a letter I received recently from one of your readers:

Dear Ted:

One of the things you mentioned in your column about the parallel interface was moving the driver loader to another

continued on page 154

Commodore's Marshall Smith Present New Strategy

Commodore International Ltd. has instituted a three-fold strategy designed to ensure a strong future, president Marshall Smith told shareholders recently at the company's annual meeting.

Mr. Smith said product diversification, expansion of distribution, streamlining and consolidating of manufacturing had been accomplished in 1985 and will continue into 1986.

"Commodore remains entrepreneurial with an arsenal of products and software, peripherals and enhancements that will greatly increase our maneuverability and fortify our position," Mr. Smith told shareholders.

"New products now in the market and contributing to the improved position are the Amiga™, PC-10 and PC-20 IBM PC compatible computers and the C128 personal computer," Mr. Smith said.

"The PC-10 and PC-20 and Amiga will make us a strong supplier in the business computer arena," he stated. "The C128 will exploit our very large user base in homes, schools and small businesses. For those new buyers at the entry level, the C64 is still the logical choice with its outstanding software availability.

"All our major capital expenditures are now behind us," added Mr. Smith. "These new products are performing well, and we will reap the benefits of these investments in the future."

Mr. Smith said new products will account for more than one third of total sales in the current fiscal quarter. This compares with 13 percent of sales in new products in the past June quarter.

"That's a substantial shift in a relatively short span of time, and I think it's one that points out that Commodore is a dynamic company that can address the changing needs of the marketplace efficiently."

Mr. Smith cited worldwide diversification of distribution channels as perhaps th emost important strategic development. In North America, Commodore has expanded to the computer specialty channels with the Amiga. In Europe, Commodore will support its business products with its IBM compatible line and will introduce Amiga early next year, Mr. Smith added.

New geographical sales regions also are being opened, Mr. Smith reported. These include Central and South America, Asia and the Pacific.

"We project that these new geographic markets will provide approximately 12 percent of our revenues in fiscal '86," he stated.

Mr. Smith cited U.S. consolidation of semiconductor operations and automation of Far East manufacturing facilities as examples of the efficiencies achieved in manufacturing.

"Hong Kong is now almost completely automated. Our semiconductor facilities have both lowered costs and improved their yields this year. Strong quality control programs have been put in place successfully, as well."

Concluded Mr. Smith, "These three strategic areas — upgraded product mix, expanded distribution, more efficient manufacturing — are all geared toward returning Commodore to profitability, increasing market share and lowering our break even point."

For further information contact Commodore International Limited, Executive Offices, 1200 Wilson Drive, West Chester, PA 19380. (215) 431-9100.

Mention that you read about it in *Computer Shopper.* ●

The Comal Corner

by Frank & Melody Tymon

Introduction

COMAL, or Common Algorithm Language, has been aborning over the last decade. Designed by Borge Christensen and Benedict Loefstedt in 1973, it has had an ever-increasing following in Europe. With the release of the COMAL 2.01 cartridge by Commodore Comal has come of age. The potentails implied by the earlier versions of the language are actualities in this release. And the availability of the cartridge for the Commodore 128/64 will undoubtedly result in extensive usage in America. And, to add icing to the cake, there are now at least two versions of COMAL for the IBM PC. Of equal importance is the fact that COMAL programs are portable between brands of computers.

As a result of this projected growth a large audience will soon exist for COMAL information. The need for a recurring column providing guidance in COMAL use, reviews of the newest advances, and assistance in resolving problems is evident.

That is the function of this column. Here we will introduce some of the techniques for using COMAL, a variety of useful programs, and an objective review of COMAL products.

The Comal Language

There are four characteristics of COMAL that make it a major contender as a standard language. The first of these is that it uses many of the BASIC instructions with little or no change. Programmers familiar with BASIC can quickly learn the nuances, and program in COMAL.

The second characteristic is that COMAL has much of the structured capability of Pascal. Such structures as REPEAT, UNTIL, IF...ENDIF, WHILE...ENDWHILE, and the CASE format provide the capability to maintain a structured sequence. On the other hand the language leaves you more flexibility for exploratory programming.

Third, and perhaps most important, COMAL introduces a unique growth path for the language. By using such entries as USE GRAPHICS, USE TURTLE, etc., an additional extension of the basic COMAL language is appended. At this time there are 11 such packages. Undoubted as the language gains in popularity and the ease of this growth path is recognized more and more such packages will surface. For example, we would expect to see a USE VOICE-SYNTHESIZER in the immediate future.

As a result of this approach the COMAL kernal remains standardized and unchanged even as the language grows. Furthermore, once a package is appended the associated instructions are treated by the kernal as though they were part of the original instruction set.

This characteristic of incremental growth makes COMAL an easily expandable language. Its competitors, at present, cannot provide such an easy growth path. They either require periodic replacement of the original language unit, or unduly complex programming, or extensions which are not generally compatible with the original language.

The final characteristic, and one mentioned earlier, is that of portability. A program written in COMAL will run on any other computer having the COMAL package, so long as the standard packages are used. (Of course, since some computers don't support sprites they couldn't be expected to run a sprite program. Computer peculiar enhancements can't be expected to run on non-compatible systems.)

References

Any user of COMAL should quickly become familiar with the COMAL Users Group, 5501 Groveland Ter., Madison, WI 53716. This organization has been a key factor in the growth of the language in the United States, and is a source of current information on varied aspects of the language. They offer a variety of books and diskettes of value to the beginner, as well as to advanced users.

The second reference is The COMAL Handbook, written by Len Lindsay and published by Reston Publishing Co. This

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Business Software Introduced For Commodore's Amiga

High powered busines software and programming utilities for Commodore's new Amiga personal computer are now available at local computer specialty stores.

Word processing software, accounting programs, a spreadsheet, desk accessories, a communications program and a paint program are among the first wave of products announced for the highly acclaimed Amiga, which began shipping to dealers in late September.

Most products cost less than $200 and many cost less than $100.

Chang Laboratories

"We're committed to Amiga and we think there is a strong market for it," said Larry Perry, vice president of marketing for Chang Laboratories.

Chang Laboratories, developers of the critically acclaimed Rags to Riches accounting series, is shipping Amiga versions of its General Ledger, Accounts Receivable and Accounts Payable programs. Each of the three programs costs $199.95.

Dealers can order the programs directly from Chang by calling 408-246-8020 or through their Amiga representative.

Lattice

Lattice said it will introduce seven software packages, including a spreadsheet and programming tools, according to Steve Hersee, director of marketing for Lattice, based in Glen Ellyn, IL (312-858-7950).

The programs ready for shipment are:

*Unicalc, a full featured spreadsheet that reads Lotus files, $79.95 retail.

*dBC III File System, allowing Amiga users to read and analyze dBase III files, $150.

*Lattice Screen Editor, a full screen editor, $100.

*Text Utilities, an assortment of Unix Utilities $75.

*MacLibrary, a timesaver for programmers in C language, featuring the benefits of the Macintosh Quick Draw program, $100.

*Lattice Make Utility, a Unix-based programming tool, $120.

*Panel, an application generator written for C programmers, featuring audio help, $195.

MaxiSoft

MaxiSoft, of Pebble Beach, CA said it is shipping two packages which take advantage of Amiga's multi-tasking operations.

*MaxiComm, a communications package which retails for $50.

*MaxiDesk, a desktop utility which includes a telephone directory, notepad, calculator, dialer, alarm clock and appointment calendar. It retails for $70.

"We get power to people at a not powerful price," said Randolph Bills, director of marketing for MaxiSoft.

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ROBOTICS

Probots And People "Electronics Kits"

Part IV

by Tim Knight

One inexpensive way to learn about the world of robotics is through electronic kits. Most people are somewhat reluctant to delve into electronics, but a number of easy-to-build kits have been introduced which are not only a lot of fun but will also teach you simple robotic concepts as well. These kits include those called Movits, those from Bandai Electronics, and the ones you can build yourself from inexpensive parts.

Movits

Movit kits are made by OWl, Inc. of Japan and have been in the United States for only about a year. Each Movit performs one particular function so you can learn about that specific application of robotics. Although these are sophisticated kits ranging in price from $25 to $100, they are very easy to build, requiring neither soldering nor electronics assembly. You do have to screw the parts together to make the tiny robots, which often are no more than four or five inches in width.

More Movits are being introduced every few months, but the ones available now available now are:

Sound Stepper - This little robot has a sound sensor so it will walk for a few seconds when you clap your hands. Retail price: $24.95.

Peppy - Equipped with a small ultrasonic sensor and sound detector, Peppy will walk along, avoiding obstacles it encounters and turning left whenever it hears a sharp handclap. Retail price: $24.95.

Medusa - A larger version of Sound Stepper, Medusa walks for a few seconds when you clap your hands and then stops until another handclap is detected. Retail price $27.95.

Mr. Bootsman - This four-legged robot can move two different speeds as directed by the remote control box you hold. Retail price: $30.95.

Line Tracer - If you draw a black line on a light background, Line Tracer will follow whatever pattern you have created. It does this with a tiny photosensor which can detect a line that is at least 3/8 of an inch wide. Retail price: $39.95.

Amazing Avoider - This is a more sophisticated version of the Peppy Movit since it is larger and more accurate. Avoider will move away from obstacles in its path and will also make a sharp left turn if you clap you hands. Retail price: $44.95.

Piper Mouse - Using the small whistle equipped with this Movit, you can cause this little robot to make a sharp turn from its path if you blow the whistle and it detects the shrill pitch. Retail price: $44.95.

Navius - One of the most recent Movits, Navius has a circular paper disk on which you can put dark and light square blocks. These blocks tell the Navius which direction to go, so you can program this robot simply by placing the dark and light squares on the disk to correspond with the pattern you want. Navius will read the disk and will carry out his instructions. Retail price: $49.95.

Circular - This is a radio-controlled robot which can go forward and turn in any direction by pivoting on its axis. Circular consists mainly of two large wheels which drive and turn the robot, and the remote control allows you to command it to go a certain direction. Retail price: $69.95.

MemaconCrawler - If you want a self-contained robot that can remember your commands, MemoconCrawler is for you. By using the keypad included with the robot, you can instruct it to go forward, backward, left, right, sound a buzzer, or light an LED lamp. It will remember up to 256 of these commands and will "play them back" when you disconnect the keypad and press the touch sensor. As with all the other Movits, memoconCrawler is very fast and extremely accurate when traveling about its pre-programmed course. Moreover, you can connect it to an Apple, PCjr or Commodore 64 computer with an optional interface so you can program it through the computer and have a much greater amount of memory to work with. Retail price: $74.95. Interface (optional): $39.95.

WAO - This is the very latest of the Movits, and it is a very big step forward for these small kits. WAO, like MemoconCrawler, can be programmed. However, its keyboard is relatively sophisticated, and you can program it in its own language, complete with subroutines, breaks, and action commands. WAO can move about in the pattern you program and will remember this pattern; however, it can also *draw* whatever pattern you have programmed. Moreover, it has alphanumerics pre-programmed into memory so you can get it to spell out your name or a short sentence very easily. WAO is absolutely amazing, and for the money, there's no comparison. Retail price: $99.95.

Movits kits don't require any special tools for assembly. You just need a small phillips-head screwdriver and a lot of patience - the larger kits take about 3 hours of work with tiny screws and gears before you discover whether thing actually works or not. Movits are an excellent, inexpensive way to be introduced to robotics, and you can have a lot of fun with them in the process.

Bandai, the same Japanese company which makes the Transformer toys, also makes electronic kits which aren't quite so serious as the Movits but are actually more complex. They're not difficult to build, either, since they're geared for teenagers and young adults.

One of the kits is called DiscoKid. Like the name suggests, this little robot not only plays music with its speaker (it must be hooked via cable to a radio or tape recorder), but it also dances to the music. It is equipped with a small microphone so that you can have music playing in the background to which it dances, regardless of whether it's connected via cable or not. The dancing is really fun to watch, since DiscoKid moves his arms up and down, swings his head left and right, and moves his torso to the beat of the music. He costs only $54.95 and is probably the most amusing robot around.

Another entertaining robot kit is ProSports, costing $99.95. ProSports can pretend to play golf, basketball, baseball, and bowling. Although he won't be very challenging in a game against a human, he goes through the motions of these various sports, and you can control his actions via a wired remote control unit.

Bandai offers other electronics kits, and it should be exciting to see what new introductions will be made. One type of kit that is just starting to become available in the United States is the Gyrobot, which utilizes a gyroscope to get the robot walking with a technology that is beautifully simple. Moreover, if one leg starts to go over a table ledge or stairway, the robot will simply keep pivoting until the leg finds solid ground to continue on its journey. Simple advances like this are actually big steps toward practical personal robots, and its important to learn about them now and understand how difficult problems can be overcome with a little creative thinking.

Although any one of these kits is fun to build and provides a great way to learn a new concept in robots, you might want to construct a robot completely on your own. Most people with the technical knowledge to do this simply go to Radio Shack or some similar store and get the parts together to make their creation. For those of us who would like the best of both worlds (a kit that's relatively easy to build but made from parts that you scrounged up yourself), several books are available that will tell you what to buy and how to put the parts together into a working robot. David Heiserman has done a number of books with Tab Books of Blue Ridge Summit, Pennsylvania, that will help you build your own robot pet. If you haven't had much experience, you may want to start with an excellent new book from Simon & Schuster entitled *The Everyone Can Build a Robot Book*. It tells you how to build a "moth" robot which, appropriately enough, is attracted to light.

If you are interested in getting a Movit or Bandai kit or one of these books, contact Robot Center at (408) 255-2331 or Rio Grande Robotics at (505)524-9480.

Tim Knight publishes *Personal Robots Magazine* and is the President of Robot Center, the first personal robot store in the Silicon Valley. You can write him at P.O. Box 61046, Palo Alto, CA 94306-1406. ●

Printer Switch Extends Operating Distance

DS-CAPS IBM PC or any MS DOS PC system may use this low cost code activated printer sharing switch supplied with software on diskette. This allows selection through your program or keyboard of high speed dot matrix printer or letter quality printer for word processing applications. Printers may be named or referred to as specified in software. The electronic switch allows great distance between your computer and printers. Printers may be installed up to 30 feet away to reduce noise and improve location. Saves time from connecting and disconnecting cables. All connectors are female DB 25S and mating connector DB 25P male. Plastic case size is 5.8"x3.8"x1.0". Self power with power indicator. Weight 17 ounces. List price $89.00.

For further information contact VIR West, Inc. 534 N. Stone Ave., Tucson, AZ 85705, (602) 623-5716.

Mention that you read about it in *Computer Shopper*. ●

RS232 DATA COM SERVICE AIDS

An Excellent Christmas Gift

WHAT YOU GET		DISCOUNT PRICES	
DLMS-2	46.95	1 OR 2	109.95
DTAS	29.95	3-9	99.95
DG25F	16.95	10	87.96
DG25M	16.95	Over	P.U.R.
Carry Case	4.95	MODEL DK4	
Total Value	115.75		

Four of our most popular RS232 devices in a hand some carry case. Our best Data Line Monitor shows high, low, and open status of 7 key signal lines. The mini Data Test Adaptor allows access to every RS-232 pin for testing and custom interfacing, and comes with a set of 2 Gender Changers. ——— A limited time offer at reduced prices - Just compare! Add $4.50 for shipping and handling regardless of quantity. Use our Toll Free calling for prompt delivery.

DATA LINE MONITOR

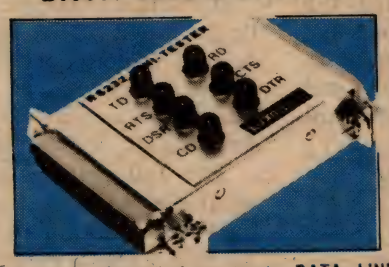
A minature **DATA LINE MONITOR** allows the user to determine the status of the seven key signals of the RS-232 data path. All 25 pins wired through. Dedicated red LED's report the status of:

- Transmit Data (TD) pin 2
- Receive Data (RD) pin 3
- Request to Send (RTS) pin 4
- Clear to Send (CTS) pin 5
- Data Set Ready (DSR) pin 6
- Data Carrier Detect (DCD) pin 8
- Data Terminal Ready (DTR) pin 20

Choice of Plastic or Chrome Metal Housing.

MODEL	TYPE	GENDER	1-9	10-24	25-99
DLM	Std.	M-F	35.45	32.26	28.36
DLMS	Metal	M-F	36.95	33.62	29.56

DATA LINE MONITOR



New Deluxe Version of our popular **DATA LINE MONITOR** is now available with red and green LED's to indicate Hi, Low or Open conditions. Metal shell construction takes abuse.

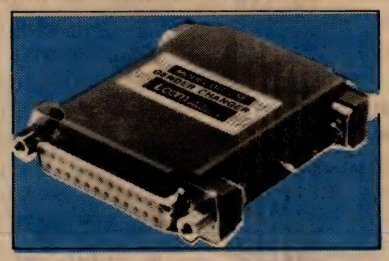
MODEL	TYPE	GENDER	1-9	10-24	25-99
DLMS-2	Metal	M-F	46.95	42.72	37.56

RS232 LINE PROTECTOR

RS-232 DATA LINE SURGE PROTECTORS Guard against lightning and electrical spikes entering the RS-232 ports. Metal-Oxide varistors on key signal lines act to clamp surges above 27 volts without affecting normal operation. This compact adaptor mounts permanently in series. All 25 lines are wired through. To be most effective Surge Protectors should be provided on both ends of a long line.

MODEL	Lines	1-9	10-24	25-99
DSPS-3	2,3 & 7	24.95	22.70	19.96
DSPS-4	2,3,7, & 20	26.95	24.52	21.56
DSPS-5	2,3,4,5,& 7	28.95	26.34	23.16
DSPS-7	2 thru 7 & 20	32.95	29.98	26.36

GENDER CHANGER



RS-232 GENDER CHANGERS - Are handy devices enabling the mating of wrong sex cables to equipment or to other cables. ABS encased or metalized to offer maximum shielding, will withstand extensive abuse. Four models fill most requirements.

MODEL	TYPE	GENDER	1-9	10-24	25-99
DG-25F	Std.	F-F	16.95	15.42	13.56
DG-25M	Std.	M-M	16.95	15.42	13.56
DGS-25F	Metalized	F-F	17.95	16.33	14.36
DGS-25M	Metalized	M-M	17.95	16.33	14.36

RS232 ADAPTOR KIT

DO IT YOURSELF KIT - Allows the creation of many types of RS-232 adaptors. The following components are included in the assortments.

- 2 ea. 25 Pin D-Sub Connectors (see gender below)
- 2 ea. Snap-on half covers (UL 94VO)
- 1 set Hardware for each connector end

D-Sub connectors have solder cup terminations to accept wire leads. Choice of Plastic or Chrome Metal Housing.

MODEL	TYPE	GENDER	1-9	10-24	25-99
DIY	Std.	M-F	10.95	9.96	8.76
DIYS	Metal	M-F	12.45	11.33	9.96
DIYS-F	Metal	F-F	12.45	11.33	9.96
DIYS-M	Metal	M-M	12.45	11.33	9.96

SERIAL-PARALLEL ADAPTOR KIT

RS-232 TO CENTRONICS ADAPTOR KIT - Used to customize your own printer adaptors. The DB-25 has 25 flying leads, ready to be soldered to any of the 36 pin Centronics. Your choice of standard or metalized covers.

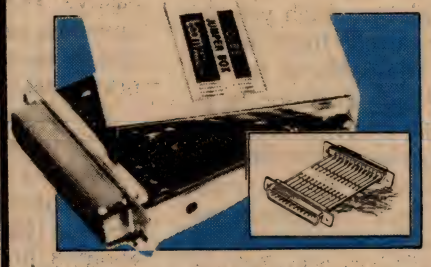
MODEL	TYPE	GENDER	1-9	10-24	25-99
DJBA	Std.	M-M	24.95	22.70	19.95
DJBA-2	Metalized	M-M	26.95	24.52	21.56

RS232 TEST ADAPTOR

A minature **DATA TEST ADAPTOR** provides ready access to all 25 lines of the RS-232 interface. Only 2" x 2.5" x 0.5" in size. Has one male and one female connector for inline use. All 25 pins of each connector terminate to individual sockets which allow the two connectors to be interwired or jumped in any pattern. Comes complete with 20 jumper wires. Shielded Chrome Metal construction.

MODEL	TYPE	1-9	10-24	25-99
DTAS	Metal	29.95	27.25	23.96

RS232 JUMPER BOX

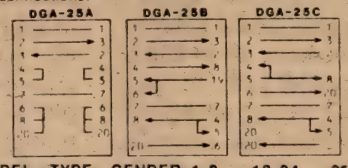


DATA JUMPER BOX - Used to customize RS-232 interface devices. All 25 pins of the D-Sub Connectors terminate to 25 solder pads. The PC Board layout makes it easy to wire your own adaptor. Supplied with 25 wires already stripped for permanent wiring. Many interfaces could be built, null modems, pin reversers, you name it. Supplied with PC Board already soldered in place. Snap-on Chrome Metal covers and appropriate hardware are unassembled. Your choice of genders.

MODEL	TYPE	GENDER	1-9	10-24	25-99
DJBS	Metal	M-F	21.95	19.97	17.56
DJBS-F	Metal	F-F	21.95	19.97	17.56
DJBS-M	Metal	M-M	21.95	19.97	17.56

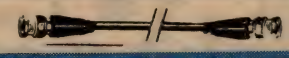
MODEM ADAPTOR

MODEM ADAPTORS - Eliminate the need for modems when connecting local terminals together or terminals to computer. Circuit codes are shown to identify pin connections.

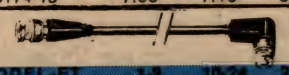


MODEL	TYPE	GENDER	1-9	10-24	25-99
DGA-25A	Std.	M-F	16.95	15.42	13.56
DGA-25B	Std.	M-F	16.95	15.42	13.56
DGA-25C	Std.	M-F	16.95	15.42	13.56

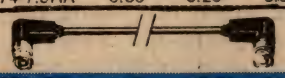
COAXIAL CABLES



MODEL-FT	1-9	10-24	25-99
CC58C-1	3.55	3.23	3.05
CC58C-1.5	3.70	3.37	3.18
CC58C-2	3.85	3.50	3.31
CC58C-2.5	4.10	3.73	3.53
CC58C-4	4.40	4.00	3.78
CC58C-5	4.65	4.23	4.00
CC58C-10	6.05	5.51	5.20
CC58C-15	7.45	6.78	6.41
CC58C-25	10.75	9.33	9.25
CC59B-1	3.65	3.32	3.14
CC59B-2.5	4.00	3.64	3.44
CC59B-5	4.75	4.32	4.09
CC59B-10	6.25	5.69	5.38
CC59B-15	7.75	7.05	6.67
CC59B-25	10.75	9.78	9.25
CC59B-50	18.25	16.61	15.70
CC59B-100	33.25	30.26	28.60
CC62A-1	3.60	3.28	3.10
CC62A-2.5	3.95	3.59	3.40
CC62A-5	4.70	4.28	4.04
CC62A-10	6.15	5.60	5.29
CC62A-15	7.60	6.92	6.54
CC62A-25	10.50	9.56	9.03
CC62A-50	17.75	16.15	15.27
CC62A-100	32.25	29.35	27.74
CC174-1	3.60	3.28	3.10
CC174-1.5	3.75	3.41	3.23
CC174-2	3.90	3.55	3.35
CC174-2.5	4.05	3.69	3.48
CC174-4	4.50	4.10	3.87
CC174-5	4.80	4.37	4.13
CC174-10	6.35	5.78	5.46
CC174-15	7.90	7.19	6.79



MODEL-FT	1-9	10-24	25-99
CC58C-1RA	4.90	4.46	4.21
CC58C-1.5RA	5.05	4.60	4.34
CC58C-2RA	5.20	4.73	4.47
CC58C-2.5RA	5.35	4.87	4.60
CC58C-3RA	5.50	5.00	4.73
CC58C-4RA	5.80	5.28	4.99
CC58C-5RA	6.10	5.55	5.25
CC58C-7.5RA	6.85	6.23	5.89
CC58C-10RA	7.60	6.92	6.54
CC59B-1RA	4.90	4.46	4.21
CC59B-1.5RA	5.05	4.60	4.34
CC59B-2RA	5.20	4.73	4.47
CC59B-2.5RA	5.35	4.87	4.60
CC59B-3RA	5.50	5.00	4.73
CC59B-4RA	5.80	5.28	4.99
CC59B-5RA	6.10	5.55	5.25
CC59B-7.5RA	6.85	6.23	5.89
CC59B-10RA	7.60	6.92	6.54
CC62A-1RA	4.90	4.46	4.21
CC62A-1.5RA	5.05	4.60	4.34
CC62A-2RA	5.20	4.73	4.47
CC62A-2.5RA	5.35	4.87	4.60
CC62A-3RA	5.50	5.00	4.73
CC62A-4RA	5.80	5.28	4.99
CC62A-5RA	6.10	5.55	5.25
CC62A-7.5RA	6.85	6.23	5.89
CC62A-10RA	7.60	6.92	6.54
CC174-1RA	4.90	4.46	4.21
CC174-1.5RA	5.05	4.60	4.34
CC174-2RA	5.20	4.73	4.47
CC174-2.5RA	5.35	4.87	4.60
CC174-3RA	5.50	5.00	4.73
CC174-4RA	5.80	5.28	4.99
CC174-5RA	6.10	5.55	5.25
CC174-7.5RA	6.85	6.23	5.89



MODEL-FT	1-9	10-24	25-99
CC58C-1RA2	6.25	5.69	5.38
CC58C-1.5RA2	6.40	5.82	5.50
CC58C-2RA2	6.55	5.96	5.63
CC58C-2.5RA2	6.70	6.10	5.76
CC58C-3RA2	6.85	6.23	5.89
CC58C-4RA2	7.15	6.51	6.15
CC58C-5RA2	7.45	6.78	6.41
CC58C-7.5RA2	8.20	7.46	7.05
CC58C-10RA2	8.95	8.14	7.70
CC59B-1RA2	6.25	5.69	5.38
CC59B-1.5RA2	6.40	5.82	5.50
CC59B-2RA2	6.55	5.96	5.63
CC59B-2.5RA2	6.70	6.10	5.76
CC59B-3RA2	6.85	6.23	5.89
CC59B-4RA2	7.15	6.51	6.15
CC59B-5RA2	7.45	6.78	6.41
CC59B-7.5RA2	8.20	7.46	7.05
CC59B-10RA2	8.95	8.14	7.70
CC62A-1RA2	6.25	5.69	5.38
CC62A-1.5RA2	6.40	5.82	5.50
CC62A-2RA2	6.55	5.96	5.63
CC62A-2.5RA2	6.70	6.10	5.76
CC62A-3RA2	6.85	6.23	5.89
CC62A-4RA2	7.15	6.51	6.15
CC62A-5RA2	7.45	6.78	6.41
CC62A-7.5RA2	8.20	7.46	7.05
CC62A-10RA2	8.95	8.14	7.70
CC174-1RA2	6.25	5.69	5.38
CC174-1.5RA2	6.40	5.82	5.50
CC174-2RA2	6.55	5.96	5.63
CC174-2.5RA2	6.70	6.10	5.76
CC174-3RA2	6.85	6.23	5.89
CC174-4RA2	7.15	6.51	6.15
CC174-5RA2	7.45	6.78	6.41
CC174-7.5RA2	8.20	7.46	7.05

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TANDY COMPUTERS

Tandy Topics

by Lon Andrews

4N1® - Combination Card For Tandy 1000

After a lot of consideration and a few gentle hits from our subtle Editorial Director about the "future of the 8 bit machine" (not to mention the outright heckling from some of my computer engineer friends) I took the plunge and brought home a Tandy 1000. After all the price was right and the monitor was "free." Even with all that my wife saw right through me in about 10 seconds. OK so I just wanted a 1000. No sin in that, is there?

Once I actually had the machine I was anxious to do all the right things. And then I found out about the expansion slots and cards. Seems like there is never enough to do what you want. My Model III had to become a 4. The 4 had to get a speed up. And then a memory board. And on and on and on ....

Actually the 1000 has three expansion slots available for your use. The trick is to get as much out of each slot as you can. Enter the 4N1® Multifunction Card from Micro Mainframe. Using this board in one of the slots you can add memory increments of 64K, 128K, 256K or 512K. A RS-232 serial port is included with the board. By using the expansion port on the 4N1 you can piggyback a clock/calandar board, also available from Micro Mainframe. The board is complete with the Direct Memory Access (DMA) controller so it can be the first board added or the only board added if you don't want to add more to the system.

The RS-232 can handle transfer rates from 50 baud to 9600 baud and can be configured as COM1 or COM2 by using a jumper. The DMA is not set up with a jumper so it can not be turned off.

Memory is added by plugging 64K or 256K RAM chips in to the 16 sockets on the board. These chips are available with the board or you can supply your own. I used the 256K chips and added 512K to my system. The only trick to putting these chips on a board is to take your time and follow directions. They are sensitive to static so be careful.

Once the memory is added be sure that the jumpers are set to the amount of memory that you have added. There are three jumpers. Be sure to check each one against the settings in the docs.

Installing the card is simple. Be sure that all the power to the system is turned off before you open the case. Unplug the keyboard cable connector front the front of the computer and set the keyboard aside. Set the monitor aside if it is in the way. Again take care that you have discharged any possible static charge by touching a good ground. Remove the two screws from the from of the case and slide the case forward to remove the cover. If the 4N1 is the first board to be added, it is probably best to use the slot closest to the outside edge of the computer.

Remove the sheet metal screw that holds the outside cover for the slot in place. Save the screw as it will hold the card in place. Remove the cover and save it in case you need to use it if you change the system around later on. Again ground yourself and grasp the card by the upper edge. Plug the card in the connector and be sure that it is aligned properly with the opening. Replace the screw. Put the cove back on, plug in the keyboard and then you are ready to power up with the new card installed.

Look for the memory size display on the screen. It should match the memory added plus 128K. Micro Mainframe gives you a procedure to follow if you have a problem. I don't think you will, I didn't and if Murphy is gonna find some one it will be me. The board works like a charm - just exactly as Micro Mainframe advertised.

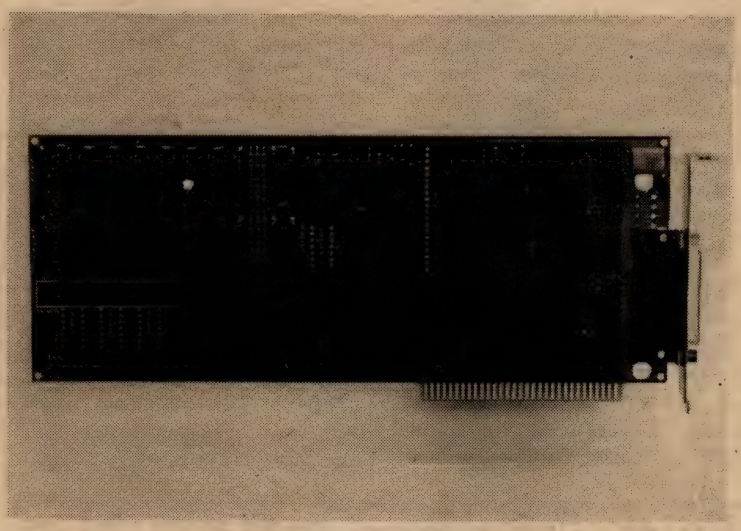
The 4N1 is obviously well constructed. It installs easily with no real problems with size. It is a close fit and with the clock/mouse board attached it will be even closer but I don't see any problems. The clock/mouse board was not available so I couldn't try it out. The docs are short but very adequate and easily understood. If you buy your own memory chips you can probably save between $16 and $20 but Micro Mainframe has a lifetime warranty on chips supplied by them and you will be sure that the board has been checked out with memory installed. I would prefer to pay the extra and have the assurance and warranty.

An excellent product for the Tandy 1000. I recommend the 4N1 if you want to expand your system.

4N1 Combination Board for the Tandy 1000. Ok Memory $259.95; 256K Memory $299.95; 512K Memory $339.95; Clock/Mouse extra.

Micro Mainframe, 11285-E Sunrise Gold Circle, Rancho Cordova, CA 95670. (916) 635-3997.

continued on page 68



4N1 Combination Card

Free Financial Programs For TRS-80 Model 100

by Dr. Michael W. Ecker

In the last few years, I have become increasingly interested in financial mathematics: compound interest, loan amortization, annuities. Indeed, I have written about some of these topics in several publications. However, I have only recently put together this little mini-collection of three programs for the Model 100 portable. Although I did it as a lark, and although they are not as full-featured as one might want for more serious computing, they represent useful programs which you can maintain resident in RAM for use at any time. Indeed, in a certain sense, their shortness, coupled with the friendly and simple menu format, make them ideally suited to the 100. Given the simplicity of use of the 100, this is about as pleasant as one can hope for.

You may, as a *Computer Shopper* reader, make copies to share with friends, provided you do not sell them. This is the only waiver of copyright I am providing, and the copies should include my authorship. At the end of the article, I will tell you how to obtain a tape with the programs if you do not wish to type them in yourself. Whether you choose to invest a little time or a little money (just to cover the processing costs) is entirely up to you.

In future articles, I may consider the question of more sophisticated versions which allow hardcopy printouts, other financial questions, and variable annuity deposits, but it is most likely that these versions would be for desktop machines such as the Tandy 1000 and MSDOS machines in general. In point of fact, I sell fuller-featured, commercial grade versions of these programs for TRS-80 and MSDOS computers. Please write me at the address at the end of the article if you would like more information. If reader response warrants it, however, I will consider upgrading the free programs I am providing here for the Model 100.

Interest, Annuities, Amortization

The program itself is menu-driven following a title and introduction. You choose between running a compound-interest program, an annuity program involving only constant periodic payments, and a quick loan amortization program. The subroutines for these have been neatly separated to begin at lines 1000, 2000, and 3000 respectively. All programs allow you to either run the same portion again or to return to the menu. There is a mdoest amount of error checking in the program; not enough to catch every conceivable one if you are really determined to trip up the program, but enough to catch the kinds that arise in actual practice. Most variable names have been kept shorter to conserve RAM. Besides, my understanding is that the 100 uses only two-variable names anyway.

The compound interest program simply does what you might expect it to do: It tells you how much money you will have in an account with just one deposit of principal made one time which subsequently earns interest. Bear in mind that with each compounding or application of interest, the principal grows, and thus not just the original principal but also interest earns interest. (Hence, the term "compounding".) Rather than show all the intermediate payments, I calculate the final payment in one fell swoop in line 1140.

The annuity portion, on the other hand, shows all the intermediate calculations. As you know, an annuity account involves a sequence of payments to an interest-bearing account. As the account grows, one builds up amounts which provide one with a fund from which to draw later, typically in retirement. One can then amortize the total accumulated over a period, say 10 years, to find out how much you can live on from that fund. The annuity program calculates the first part, namely, based on the amount you deposit each period, to determine the value of the account at some point in the future.

continued on page 68

Free Financial Programs continued from page 67

Although I could have provided a formula to do this, too, in one fell swoop (after all, such is not a difficult feat for a PhD mathematician), I felt it would be more interesting to view the growth of the account. This also allows modification should I (or you) wish to add the feature of variable periodic payments to the account later on. I hasten to add that the annuity portion does **not** calculate how much you will have each year upon retirement. More about that, however, in a moment.

The classical loan amoritzation question is: Given the amount you borrow (principal), the nominal annual interest rate (percent), and the period or term of the loan (in years), how much is your monthly payment? It is beyond the scope of my intention to explain how I derived the formula (present value, geometric series and so on) in line 3120. Suffice it to say that I have been using it for years with no substantially adverse consequences or differences with commercial programs or values supplied by banks. Again, I do not provide a breakdown, nor hardcopy capability here, although my commercial software for TRS-80 Models 1, 3, 4, Tandy 1000 (but not 100) and all MSDOS machines, does have these and other features. (Sorry, Model 100 users, but I was not planning to go into the Model 100 software business!)

Concerning the loan program, note that you can use the annuity program to determine the value of your annuity account upon retirement. Then, with the value memorized,, return to the menu and choose the loan program. Use the amount you memorized as the principal, the number of years you would like to enjoy the money over, and the interest rate as whatever prevailing interest rate you are earning on the account, or expect to earn on the account, I should say. (In other words, you are effectively lending the financial institution the amount of money you've accumulated. Hence, the loan program applies.)

I've tried to design the program to be quick, easy and intuitive, but perhaps I have overlooked something. If you have any questions, I will be delighted to correspond with you, provided you enclose a self-addressed, stamped envelope and detail your question carefully. Please advise of all computers you own when you write, too. For those of you who would prefer not to type in the program yourselves, please send me a blank tape, a self-addressed, stamped envelope with 39 cents postage, and $5, and I'll send you the program (or an improved version if any improvements have been added by the time you get this). If you prefer, you may send $8 and omit the SASE and the blank tape. Either way, I will CSAVE the program at least twice on the tape and test it before returning it to you. Write to me:

Dr. Michael W. Ecker
Computer Shopper
P.O. Box F
Titusville, FL 32781

●

```
DR. ECKER'S FINANCIAL PROGRAMS FOR THE TRS-80 MODEL 100.

10 CLS: PRINT "FINANCIAL PACKAGE"
20 PRINT "copyright (c) 1985"
30 PRINT "Dr. Michael W. Ecker"
40 PRINT "Recreational Mathemagical Software
50 PRINT "129 Carol Drive
60 PRINT "Clarks Summit, PA 18411
70 PRINT:INPUT "      -- more --      "; X$
80 CLS
90 PRINT "MENU OF PROGRAMS"
95 PRINT "================

100 PRINT "1) COMPOUND INTEREST
110 PRINT "2) ANNUITY PLANNING
120 PRINT "3) LOAN AMORTIZATION
125 PRINT "4) QUIT PROGRAM
130 PRINT
140 INPUT "CHOICE NUMBER (1,2,3,4)";N
145 IF N=4 THEN END
150 IF N<>1 AND N<>2 AND N<>3 THEN 140
160 CLS:ON N GOSUB 1000,2000,3000
170 CLS: GOTO 80

1000 PRINT"===COMPOUND INTEREST CALCULATION==="
1010 PRINT "I'll ask you the amount you wish to
1020 PRINT "deposit (one deposit only), followed"
1030 PRINT "by the interest rate (percent) and the"
1040 PRINT "term in years, as well as the number"
1050 PRINT "of times per year interest is given."
1060 PRINT: INPUT "Enter to continue";X
1070 CLS
1080 INPUT "Principal (no dollar sign)"; P
1085 IF P<0 THEN 1080
1090 INPUT "Annual interest rate (percent)";I:R=I/100
1095 IF I<0 THEN 1090
1100 INPUT "Time (number of years)";T
1110 INPUT "How many times per year (interest)";N
1120 PRINT:INPUT "Enter for results";X$
1130 CLS: PRINT "At the end of the period, you will have
1140 A=P*(1+R/N)^(N*T)
1150 A=INT(100*A)/100
1160 PRINT "$"; A
1170 PRINT
1180 INPUT "Do more interest calculations (Y or N)";R$
1190 IF R$="Y" OR R$="y" THEN 1070
1200 RETURN

2000 PRINT "ANNUITY PLANNING"
2010 PRINT "================"
2020 PRINT "In this portion, you can make financial"
2030 PRINT "projections of retirement income.
2040 PRINT: INPUT "Enter for more ---";X
2050 CLS
2060 PRINT "I'll ask you how much you wish to
2070 PRINT "save or deposit each period. That is,"
2080 PRINT "specify the constant amount you will"
2090 PRINT "deposit each period. Then give the"
2100 PRINT "expected average high and low interest"
2110 PRINT "rates (or any two rates - percents),"
2120 PRINT "followed by the period of payments in
2130 PRINT "years."; PRINT "    ";:INPUT "More --->";X$

2132 CLS:PRINT "ALSO GIVE THE NUMBER OF PAYMENTS PER
2134 PRINT "YEAR WHEN ASKED FOR THE FREQUENCY."
2136 PRINT "INTEREST IS ASSUMED TO BE GIVEN FOR ANY
2138 PRINT "PREVIOUS BALANCE AT PAYMENT TIMES.":PRINT
2139 INPUT "READY TO BEGIN (ENTER)";X$
2140 CLS
2150 INPUT "PRINCIPAL (PERIODIC PAYMENT)";P
2155 IF P<0 THEN 2150
2160 INPUT "FIRST INTEREST RATE";I1
2165 IF I1<0 THEN 2160
2168 I1=I1/100
2170 INPUT "SECOND INTEREST RATE";I2
2175 IF I2<0 THEN 2170
2178 I2=I2/100
2180 INPUT "PAYMENT FREQUENCY (number per year)";N
2185 IF N<0 OR N<>INT(N) THEN 2180
2190 INPUT "TIME IN YEARS";T
2195 PRINT
2200 INPUT "Enter for results --->";X$
2210 CLS
2215 PRINT "PERIOD  ";
2216 PRINT "BALANCE #1  ";"BALANCE #2"
2218 FOR DL=1 TO 1000:NEXT DL
2220 S1=0: S2=0: REM 2 RATES, 2 SUMS
2230 FOR PERIOD=1 TO N*T
2240 S1=(1+I1/N)*S1+P
2250 S2=(1+I2/N)*S2+P
2255 S1=INT(S1*100)/100
2256 S2=INT(S2*100)/100
2260 PRINT PERIOD;" ";S1,S2
2270 NEXT PERIOD
2275 PRINT "BALANCES: "; INT(100*S1*(1+I1/N))/100;
2276 PRINT INT(100*S2*(1+I2/N))/100
2280 FOR DL=1 TO 1000:NEXT DL
2290 PRINT "DO MORE ANNUITIES (A)?
2300 PRINT "OR RETURN TO MENU (M)?"
2310 INPUT "Touch M or A, then Enter";N$
2320 IF N$="M" OR N$="m" THEN RETURN
2330 IF N$="A" OR N$="a" THEN 2050

3000 PRINT "QUICK LOAN AMORTIZATION"
3010 PRINT "======================"
3020 PRINT: PRINT "ANSWER THE QUESTIONS
3030 PRINT "AND THE COMPUTER WILL PROVIDE YOUR"
3040 PRINT "MONTHLY PAYMENT AMOUNT."
3050 PRINT:INPUT "MORE ---->>";X$
3060 CLS
3070 INPUT "PRINCIPAL (AMOUNT BORROWED)";P
3080 INPUT "ANNUAL INTEREST RATE (percent)";R
3085 R=R/100
3090 INPUT "TERM OF LOAN (NUMBER OF YEARS)"; T
3100 PRINT
3110 PRINT "YOUR MONTHLY PAYMENT AMOUNT IS ";
3120 A=P*R/(12*(1-(12/(12+R))^(12*T)))
3130 A=INT(100*A+.5)/100
3140 PRINT A
3150 PRINT: INPUT "L FOR MORE LOANS, M FOR MENU";X$
3160 IF X$="L" OR X$="l" THEN 3000
3170 IF X$="M" OR X$="m" THEN RETURN
3200 END
```

Tandy Topics continued from page 67

LABLMAKR.PC
The Label Maker

The ETS CENTER has had the labelmaker program for TRS 80 Model III on the market for some time. I have used it for several years and loved every minute of that use. The Model III program required an Epson printer and it was for this reason alone that I purchased our first Epson.

The function of **LABLMAKER** is just what the name implies, making labels. The program is menu driven and very easy to use. You are provided with 26 sample labels that can be edited to fit your needs, then saved to disk and/or printed in any quanity that you desire. The 26 examples will fit almost any labeling need. These use 5 type-styles and four sizes of labels. If however there is a type that you need that isn't represented you can use combinations of the various types to create a new type of label to suit your application.

At this point I would have said, "So What, any dunce with a word processor can make all the labels he wants. Why put out the dough for another program to do what I can already do with what I've got?" If you are good with graphics you may have a point but I doubt it. Each label is set up with different prints and formats. There are so many possibilities that I find it hard to believe you would ever need a label not already provided.

LABLMAKR.PC requires that the production disk be in **DRIVE A** as it reads the "signature" from that disk in order to run. DISKCOPY will copy the files but not the "signature." A special version is available for copy to hard disk that requires no signature disk. The Model I/III/4 versions are not copy protected and do not require the original disk. At least the version that I have is not protected and I have not checked on later versions.

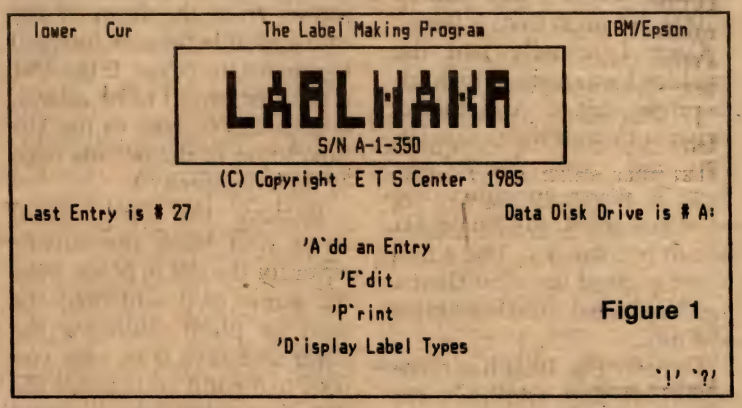


Figure 1

The **MS-DOS** version requires 128K, **DOS** 1.1 or later, at lest one drive and a dot matrix printer (Epson, Prowriter, NEC, Gemini 10 or compatible). My **DMP** 2100p works like a charm. The Model I/III/4 versions require 48K, two drives and an Epson printer.

In order to use the **MS-DOS** version first boot up with your **DOS** disk. From **DOS** ready put the **LABLMAKR** disk in Drive A and enter "LABLMAKER" or "**AUTOEX.**" If you move the SYSTEM files to the **LABLMAKR** disk you can make it self booting and use an AUTOEXE file to bring up the program. From this point it is pretty well self explanatory. The main menu (see fig. 1) allows several options. The top right of the screen shows for what printer the program is configured. The upper left shows whether you are in the uppercase or lowercase mode and the cursor status. Last Entry # lets you know the number of the last entry. **LABLMAKR** will store up to 100 entries.

continued on page 136

ATARI

Applying The Atari

Machine Language Alphabetizer, Halley's Comet Program

by Jeff Brenner

I hope you're putting last month's Personal Appointment Calendar/Editor to good use. This month we'll learn more about PACE, calculate data on Halley's Comet, and enter an alphabetizing program that features machine language sorting and storage capability. Let's first take a look at some letters...

Reader Mail

Q. I am a first time reader of your column - I am very impressed. I would like to make another comment. It's in the form of a question: Why is the Program Perfect code a three-digit or three-letter code when they all end in "J"? Why not truncate the third letter and you'll have more room than your readers are asking for? I was just wondering about that.

Michael Bonkowski
Madison Heights, MI

A. You ask a very good question, since it does appear that the last character of the Program Perfect codes is always the same. This third character is used by Program Perfect to determine the next program line number for the automatic line numbering feature. Not only does this make it unnecessary to type line numbers when using Program Perfect, but it ensures that all lines of the program are entered.

Since line numbers of the programs in this column usually step by 10 (10, 20, 30, etc.), this third character is most often a "J" (the tenth character of the alphabet). But there are times when the line numbers do not continuously step by 10; September's Response Analysis Program is one example. In this program, the line numbers of the data statements (above 5000) step by varying amounts, and you can see that the third character in this listing changes appropriately. Additionally, the Program Perfect code of the last line of a program ends in a "Z". The "Z" signals Program Perfect to erase itself from memory.

Comment: I noticed in the 10/85 issue the problem you have had with the Basic B bug in the 800XL. Instead of getting the $15 cartridge from Atari, I got a program from First Byte called Enhancements to BASIC. It not only eliminates the bug, but also upgrades Atari BASIC by adding some excellent functions such as TRACE and DIR (disk listing straight from BASIC). And best of all, it was only $14.95. Their address is First Byte, P.O. Box 32, Rices Landing, PA 15357.

John A. Dunaway
Goodlettsville, TN

A. Thanks for the info!

Newsletters

Another two newsletters were in the mail for this month. SPACE Probes is printed by the South-Central Pennsylvania Atari Computer Enthusiasts (P.O. Box 11446, Harrisburg, PA 17108-1446). A-BUG-BYTE Newsletter is printed by the Atari - Brookville Users Group (10781 West National Road, Brookville, OH 45309).

Halley's Comet Program

There are still a few months left to catch a glimpse of Halley's comet. Halley's Comet is a public domain program and is listed this month for those interested in calculating information about the comet. When it is run, the program will ask you to enter the year, the month and the day. It will take about 20 seconds to calculate and will then display the comet's geocentric right ascension (RA) and declination (DEC), distance from the sun and earth in astronomical units, predicted magnitude of brightness, and days to perihelion (the closest point to the sun). Angles are referred to the ecliptic and equinox of 1950.

After the calculations are displayed, you are given the option of making another calculation or getting a printout. Figure 1 shows a sample calculation printout for the date February 6, 1986.

```
DATA FOR COMET HALLEY

DATE: M/D/Y=2/6/1986
DAYS TO PERIHELION.....-4

COORDINATES: epoch 1950
RA :.....21HRS  8MIN
DEC:.....-9DEG  41MIN

DISTANCES:
COMET TO SUN.....0.591   AU
COMET TO EARTH.....1.62   AU

PREDICTED MAG.....3.5
```

FIGURE 1

You astronomers out there may want to personalize the program to calcculate data for your particular latitude and longitude, or add additional features and calculations, such as data for a specific time of day. Have fun and good luck comet-gazing!

More About PACE

Now we'll learn about the remaining features of last month's feature program, the Personal Appointment Calendar/Editor.

Password

As mentioned last month, when you create an appointment file when you use PACE for the first time, you're asked to enter a password. You can enter a password to protect your appointment calendar from peering eyes, or you can just press RETURN if you do not want a password. If you do choose a password, you'll

continued on page 70

Book Review

Robot Intelligence With Experiments & Project In Machine Intelligence

by David Heiserman — Tab Books

Reviewed by John A. D'Angelo

Have you ever read the novel entitled "Flatland?" This book details the adventures of a being who inhabits a two dimension world, and the effect that a visit of a creature from a three dimensional world has on him.

For a time now I have been examining a 2 dimensional world which is inhabited by creatures of low intelligence who exist on the flat phosper screen of my computer monitor. The fascinating thing is that this world was created by a computer program as a study of artificial intelligence.

I am introducing to you two books written by Dave Heiserman entitled, *"Robot Intelligence With Experiments* (TAB 1191 $10.95)", and *"Project In Machine Intelligence For Your Home Computer* (TAB 1391 $10.95)", both books are available from TAB Books Inc. Blue Ridge Summit, PA 17214.

Dave Heiserman has written about a way to visualize artificial intelligence in action on your computer screen and uses a number of Basic subroutines to accomplish this.

First an area is created by placing a border along the edges of your computer screen, then an "Alpha creature" is created which looks like a small square. The creature is able to move about freely and also has the ability to be aware of its immediate environment. If the creature senses anything which restricts its movement it will stop moving and make a

continued on page 189

HabaWriter Word Processor for the Atari 520ST
List price: $74.95

by Clay Houston

I am typing this review on the HabaWriter Word Processor while I'm learning the operation. I am not a novice to word processors as I have access to some high quality, versatile systems and my first impression of the HabaWriter is that it's GOOD. I had a little trouble getting use to the various key control from memory but now that I'm getting up to speed, I find more and more good features.

The disk is protected but you can use it in a two drive setup as long as you keep the master in "A" when booting or in a one drive arrangement by booting with the master and then swapping to your work disk. Having a two disk setup with second and a double sided one, I elected to copy all to "B" leaving the master in "A" and eliminate the wear and tear on the master. You can get a master replacement by sending $10 and your original to Haba.

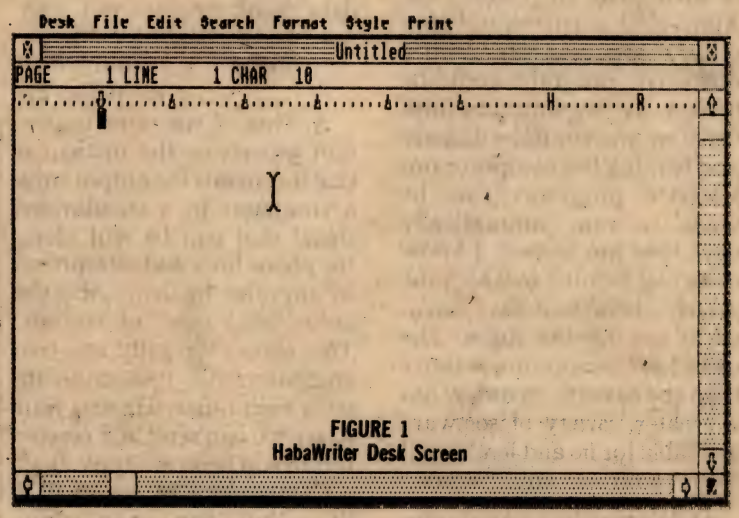


FIGURE 1
HabaWriter Desk Screen

I then double clicked WRITER.PRG in Disk B and after a short commercial the outline of Figure 1 appeared. It has seven (7) drop down menus which will basically lead you through the system. There is a cursor, a mouse pointer that flips back and forth between an arrow and an "I" (for insert), a ruler, horizontal and a vertical scroll bars and the status bar which shows page, line and character number. Also on the screen is the Ruler line which shows the current Tab settings, the left and right typing limits and the 'H' for the Hot Zone where words should be divided at the end of the line. The little triangles denote where the Tabs are set.

continued on page 187

Atari Help

by Jeff Brenner

Q. I have an Atari 400 computer which is used by my preschool children. They easily use the cartridge programs available but cannot load our cassette programs. They also have trouble waiting for me to load them. Since we have several good programs on cassette, I am looking for a way to convert these cartridges. Is there such a procedure? If so, where may I have it done and what would be the approximate cost?

Glenda York
Prattville, AL

A. Unfortunately, it is impratical to store your cassette programs in cartridge form. First of all, the progams would have to be in machine language (programs that load by pressing START when you turn on the computer). BASIC programs (those that load with CLOAD) could not be placed in cartridge form. Second, even if the programs were in machine language, they would have to be relocated to run in the memory area that the cartridge uses. Relocating a program is a tedious, complicated task and you would need to know a good deal about machine language to do it. Third, the cartridge making procedure itself (you would need an EPROM burner and blank EPROMs) is not simple.

A disk drive is a much more feasible solution, although I do not know if you had this kind of investment in mind -- the Atari 1050 is currently being sold for around $150. With a disk drive, programs could be loaded by turning the disk drive on, inserting the diskette and turning the computer on. Diskette programs can be made to run automatically once they are loaded. I know of several families in which the preschool children have learned to use the disk drive. The disk drive is also much faster than the cassette recorder, has a greater variety of software available for it, and lends itself to more serious applications.

Q. We bought an Atari computr set-up comprised of the following: Atari 800XL, (2) 1050 disk drives, 1027 printer, 1010 recorder and modem. My question to you is about this modem. Will it work with this system? The box containing my modem says "THE COMMUNICATOR II Atari 400/800 Computer System." It contains a TELELINK II program cartridge, an Atari 835 direct-connect modem plus literature.

Also, I would like to brag about Atari: I complained about the "B BASIC" in my 800XL and they promptly sent me a cartridge of "C" BASIC — YEAH ATARI! *Computer Shopper* is great, very helpful and informative.

Kenneth W. Faries
Nacogdoches, TX

A. The Atari 835 modem was released when the Atari 400 and 800 models were still in production, and was designed to match the color and style of the Atari 400/800. The newer Atari 1030 direct-connect modem was designed to match the XL series. The 835 is otherwise compatible with the 1030 and should work fine with your 800XL and the Telelink II cartridge. Of course, the best way to see if the modem works is to hook it up and try it out! You can start by calling some Atari bulletin boards listed in *Computer Shopper's* bulletin board sectin. Good luck!

I'm glad to hear that Atari sent you the revision C BASIC cartridge at no charge. Unfortunately, many Atari owners, including myself, had to part with fifteen bucks to get it. I have always felt that Atari should have provided revision C BASIC at no charge to those Atari owners who got stuck with revision B.

Q. I am a fairly new reader of *Computer Shopper* and I think your Atari column is great. Can you tell me if it is possible with an Atari 800 and a modem to access any BBS or data bank or can you only reach other Atari systems?

Jerry Burt
Greenville, PA

A. One of the most important aspects of the modem is that it converts the output from a computer to a standarized signal that can be sent along the phone lines and interpreted by any other modem (using the same baud rate, of course). This allows virtually any two computers to communicate with each other. Hence, your Atari 800 can send and receive text to and from an Apple II+, a Commodore 64, or an IBM PC. You can even communicate with an Amiga, An Atari ST, or a Macintosh. Sometimes a specialized terminal program is used by both the receiving and sending computers to provide features such as special text formatting or graphics images. For the majority of BBS's however, any communications software, such as Telelink, will be adequate.

If you want to download software you would have to be sure the programs are Atari compatible, since you would be running the actual program on your computer. There are plenty of BBS's that cater specifically to Atari owners and offer Atari-compatible public domain programs that can be downloaded. See *Computer Shopper's* "Bulletin Board" section this issue.

Q. I won an Atari 1027 printer and, as you know, this will not use more than one sheet in the rollers. Consequently, adhesive address labels are out. Instead I use Avery labels (nr. 5357) making a master sheet of the addresses and then photocopying them. The problem: If there is a list of more than 30 addresses (or one sheet) the printer must be stopped to allow for inserting a fresh sheet of paper, but how am I going to resume printing where I left off? Is there a way to do so?

Niek Vanerlee
Kingston, ON, Canada

A. Here is a simple one-line solution that will allow you to interrupt printing and continue at any time:

```
1241 IF PEEK(764) = 33
     THEN 1241
```

To pause printing, press the space bar. Printing will stop as soon as the program finishes printing the current address. Printing can be resumed by pressing any other key.

This will allow you to change label sheets when you are printing more than a page of addresses. Just press the space bar while the last address on the sheet is being printed. When this address has been printed, the program will pause and you will be able to insert and position a new sheet. Pressing any other key will then continue the printing.

Q. I have typed in **Super Clock** (*Computer Shopper*, October 1985) and have attempted to change the clock to a 24-hour format. I have not been successful so-far. (HELP!)

Hendell Helfrick
Springfield, OH

A. Following is a listing of modifications and additions that can be made to **Super Clock** for a 24-hour format, To change the clock display, modify lines 50, 60, 300, 380 and 400 and add line 425.

```
CHANGES FOR 24-HOUR CLOCK:

50 FOR T=0 TO 360 STEP 15:POSITION 19+SIN(T)*16,11-COS(T)*9.75
60 PRINT T/15;:NEXT T
300 IF H>24 THEN H=H-24
380 POKE 706,PEEK(705):POKE 705,S*4:IF PEEK(764)=33 THEN FL=0:GOTO 410
400 HA=15*(H+M/120):MA=6*M
425 IF PEEK(764)=33 THEN 200
```

Listing 1

```
CHANGES FOR 4-LINE MAILING LIST:

1245 SKP1=0:FOR J=1 TO LEN(NAME$):IF NAME$(J,J)<>"/" THEN NEXT J:GOTO 1250
1246 NAME$(J,J)=CHR$(155):SKP1=SKP1+1:NEXT J
1270 IF Q=0 THEN NAME2$=NAME$:ADDR2$=ADDR$:CSZ2$=CSZ$:GOTO 1282
1320 FOR I=1 TO VS-SKP1:PRINT #5:NEXT I:GOTO 1240
```

Listing 2

Q. How can I change Mailing List (*Computer Shopper*, June 1985) to a four-line program. I would like to have, say, a principal's name on one line and a school's on another

Eugene Curtis
Toledo, OH

A. The entire architechture of Mailing List's data structure is based on the three line format (plus additional characters for the category). Therefore it is not a simple task to modify the program for four lines. However, there is a way around this, and it involves splitting the first line up into two or more lines. Here's how it works: First add or modify the following lines on you Mailing List program (Lines 1270 and 1320 are changed, while lines 1245 and 1246 are added). Now, when entering the name on the first line, you can use the slash (/) to specify the beginning of a new line. When printing labels, the program will now change these slashes into line-feeds so the data following it will be printed on the next line. The program will automatically adjust for the extra line when printing so that the labels following are not "pushed" down by the additional line.

• While this is a clever method of obtaining the four lines, there are two limitations: First, the total number of characters on the first and "extra" lines cannot exceed the number of characters (32) normally allocated for the first line. Second, whenever labels utilizing this extra line technique are to be printed, only single-column printing can be used; the extra line will interfere with double-column label printing.

Address Atari-related questions to: Jeff Brenner, "Atari Help", c/o *Computer Shopper*, P.O. Box F, Titusville, FL 32781-9990. ●

Applying The Atari
continued from page 69

be given three chances to enter it correctly whenever you run the program. After the third try, the program will erase itself (the data - namely your appointments - is saved on the disk and will not be erased). This is why it is a good idea to choose a password you can remember, or otherwise choose no password at all. Each member of the family can have his or her own "plan diskette," and password, if wanted.

Defining Control Keys

One feature that was not discussed last month is the control-key redefinition. After you enter "Y" to the "Want to enter appointments?" prompt, you're asked if you want to define the control keys. You can define up to ten control keys, from CONTROL-A to CONTROL-J, and each key can

continued on page 185

```
                    INSTANT ALPHABETIZER
VVJ 10 REM INSTANT ALPHABETIZER
QGJ 20 REM WITH MACHINE LANGUAGE SORTER
KHJ 30 REM COPYRIGHT 1986 JEFF BRENNER
RWJ 40 LN=38
HLJ 50 DIM ABC$(109),IN$(257),SP$(255),D$(25),ID$(7):IN$(257)=CHR$(0)
AKJ 60 MAX=INT((FRE(0)-500)/LN):DIM DAT$(MAX*LN):DAT$(MAX*LN)=CHR$(0)
YIJ 70 TRAP 1010:GOSUB 1040:SP$(1)=CHR$(32):SP$(255)=CHR$(32):SP$(2)=SP$
NNJ 80 OPEN #1,4,0,"K:"
WMJ 90 TRAP 1010:CLOSE #3
PKJ 100 PRINT CHR$(125);:POKE 85,10:IN$="INSTANT ALPHABETIZER"
IRJ 110 FOR I=1 TO LEN(IN$):PRINT CHR$(ASC(IN$(I,I))+128);:NEXT I:PRINT
AWJ 120 POKE 85,10:PRINT CHR$(40);CHR$(99);CHR$(41);"1986 JEFF BRENNER"
TCJ 130 POSITION 2,4:PRINT "<E>NTER NEW LIST TO BE ALPHABETIZED":PRINT
YLJ 140 PRINT "<L>OAD A PREVIOUSLY SAVED LIST":PRINT
SIJ 150 PRINT "<D>ISPLAY ALPHABETIZED LIST ON SCREEN":PRINT
SSJ 160 PRINT "<P>RINT ALPHABETIZED LIST ON PRINTER.":PRINT
VVJ 170 PRINT "<A>DD ITEMS AND RE-ALPHABETIZE":PRINT
JDJ 180 PRINT "<R>EMOVE ITEMS FROM LIST":PRINT
IWJ 190 PRINT "<S>AVE ALPHABETIZED LIST":PRINT
EJJ 200 GOSUB 960
KPJ 210 IF C=0 AND N<>69 AND N<>76 THEN 310
TYJ 220 PRINT CHR$(125);
PWJ 230 IF N=69 THEN C=0:GOTO 330
UAJ 240 IF N=65 THEN C=C+1:GOTO 330
SWJ 250 IF N=68 THEN 480
SMJ 260 IF N=80 THEN 520
SZJ 270 IF N=76 THEN 590
SRJ 280 IF N=82 THEN 710
SWJ 290 IF N=83 THEN 830
AGJ 300 GOSUB 1000:GOTO 90
GRJ 310 PRINT CHR$(125);"NO ITEMS IN MEMORY YET"
MCJ 320 PRINT "MUST ENTER OR LOAD ITEMS":GOTO 500
JPJ 330 PRINT "YOU CAN ENTER UP TO ";MAX;" LINES"
OQJ 340 PRINT "OF ";LN;" CHARACTERS EACH."
DJJ 350 IF C>MAX THEN PRINT "YOU HAVE REACHED MAXIMUM # OF ENTRIES":GOTO 500
KYJ 360 PRINT "TYPE EACH ITEM AND PRESS RETURN."
RVJ 370 PRINT "PRESS RETURN ON AN EMPTY LINE WHEN"
QOJ 380 PRINT "FINISHED ENTERING ITEMS."
RBJ 390 IF C=0 THEN C=1
KAJ 400 FOR C=C TO MAX:PRINT
KWJ 410 PRINT :PRINT "ENTRY #";C;":";:INPUT #16;IN$:IF LEN(IN$)=0 THEN 450
```

program continued on page 186

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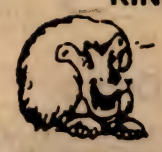

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Sanyo — The Silver Box

by Richard Fujita

The 80 Track Trick

You may be keenly aware that the size of application programs, is bloating month-to-month without bounds. A new word processing software called Palantir has more than 115k of bytes in the main module alone! If you add all the peripheral modules it will be well over 320K in size without the spelling-checker. With the spelling checker the program size is well beyond the capacity of a 9 sector double-sided disk. If you also put the operating system on your disk, the remaining available space is limited to 320K or less.

By the fall of 1985, the price of 96 tpi disk drives have come way down to basement price levels. Why not use them to solve this problem of space confinement? Ever since the summer of 1984, I have been using a 96 tpi drive in my Silver Box, (as the 'B' drive) to hold both data and document files. The 48 tpi 'A' drive was used to boot the computer and to hold the application programs. This practice reduced the number of data disks I had to keep.

But now the tide has changed, and I need more room for application programs. The word processor I use, Newword, just can't fit in a 48 tpi disk with the spelling checker. I have deleted several modules of infrequent use but, the fit is so tight that I could not squeeze in the two formatting programs I use, or I had to eliminate the system records from the disk, which is an obvious and bothersome inconvenience.

One day it became apparent to me when I was trying to tame the Mitsubishi 8453, that I must have the 96 tpi drive as the 'A' drive while placing a 48 tpi drive in the 'B' slot. The latter has enough capacity to keep the application programs, the system programs and some. The compatibility with the IBM PC format is kept by the 48 tpi 'B' drive, (a TEAC 55BV) which enables me to transport the data disks back and forth from my "Clumsy Clone," a piece of an excellent and great junk with many secrets and hidden mesmerizing charms I cannot write here.

This configuration which I call "SLASH80" is probably the best drive system you can have. As I mentioned earlier, the only draw back is the inability to conveniently copy the complete contents of the 96 tpi disks onto the 48 tpi disks. If you have to make back-ups often and frequently you should add an external 96 tpi disk drive.

The addition of an external drive is not at all difficult. What you need for an external drive installation is: a 96 tpi drive with matching case, the power connector with 16 inches of leads, a new 24 inches long drive cable with three edge connectors and perhaps a new and larger internal power supply or an external disk drive power supply. The only real problem is finding a way to have the drive cable come outside of the cabinet. The slot on the back of the cabinet for this purpose might have been taken up by the color board if you are a serious user and you may have to work hard to cut a cable opening on the left side of the cabinet. You may want to install this new drive as the drive 'D' because 'C' is usually reserved for the hard disk.

To use this configuration you need a new DOS, or a disk parameter modifying program, MOD80.EXE, written by the author. The latter modifies the part of the DOS which controls the disk operation within the domain of the MSDOS 2.11. In this way, all the DOS commands work with the 96 tpi disks exactly in the same way as they do with the 46 tpi disks. The program was written to conform with what the CHKDSK looks for and what it does. Actually, the most important part of the program came from inside the CHKDSK.COM.

Speaking of the CHKDSK, the most destructive DOS command against the non-standard disks is the CHKDSK command which will rewrite or rearrange the File Allocation Table if it detects some discrepancy against MSDOS directory rules and if the disk was not write protected. Very often, the records on a diskette becomes piles of dirt when the CHKDSK finished its investigation on a suspicious disk if the disk was not 100% compatible with the Rules of the MSDOS Kingdom. I understand that some of so called improved DOS programs do not fully conform to the governing rules.

The SLASH80 program which consists of the DOS modifier and format program modifier is being made available to the readers of this column. Send SASE to Richard Fujita, c/o Sanyo Column, *Computer Shopper.*

What Test Results Show?

* The test results in Fujita's article are his conclusion and not those of *Computer Shopper.*

The test results in the List 1 are very interesting to me. It shows some characteristics of diskettes I was not aware of for a long time since I first started to use the 5.25" diskettes.

The motor current is directly related to the drag the diskette has. The higher the current, the heavier the drag is. The lower the current the lower the drag. One, a three year old OPUS diskette, has registered 95mA current draw. The motor running without diskette draws about 50mA, and the power consumed to turn this diskette is less than 0.6W. While the diskettes with the most drag were the IBM brand. Some of the disks out of the box showed more than 205mA current draw!

The Output Level was measured at the output of the analog head amplifier. The voltage is directly related to the magnetic flux strength on the formatted surface. Higher the voltage, higher the magnetic flux density and you will get better data reliability when you read back the recorded data, providing the magnetic disk turning speed relative to the magnetic head is the same. The inner most track has the least surface speed and that is where the difference comes up most. We conducted the test at the track number 39, the inner most track for this reason.

The 'Fluctuation' in the list shows how the playback voltage changes as the media continues to turn. The values show two things. One is the accuracy of centering the disk. The other is the directional or topographic difference in the magnetic characteristics of the magnetic coating. If, the angular speed of the media, the thickness of composition of the magnetic coating and the accuracy of centering of the disk are the same and constant, there should be no output fluctuations. The less fluctuation the better data reliability. The FUJI and OPUS can be judged definitely better than any other brands in this point.

The Lustrous Fuji Diskette

It looks as if the Fuji diskette alone has not been burnished or polished after the magnetic coating has applied and dried, but, this brand of diskette has particularly good mirror like surface. To me, it looks as if it was given the smooth surface by running the coated substrate in between a hot calendar rolls. Under magnification, the surface has numerous, minute, 'rounded,' low ridges and dimples, suggesting of finishing condition at an elevated temperature and under pressure. Absolutely no burnishing scars were observed.

After several passes in a Mitsubishi 96 tpi DSDD drive, the used recording surfaces had one or two very sharp scratches which suggests the surface hardness could be somewhat softer than the other brands.

The impression of the Fuji diskette is that its surfaces are softer and easier to be scratched, but the surface in general has better flatness and mirror like luster than any other diskettes. The relative softness of the surface may require cautious handling of this diskette to avoid dust contamination and resulting scratches. The use characteristics of this diskette and others are shown in the List 1, together with the average motor current draw data. All my system and application programs which are used daily, accessed often and in prolonged reading and writing operations are placed on this brand of diskettes. In my Silver Box, the 'A' drive is now 96 tpi as described before and all the bulky application programs are bundled together with their peripheral modules in one 96 tpi disk. Eventually all my application programs will be on this brand of diskettes.

One thing I object to in this brand is the so called "Super Hub Ring" which simply and clearly does not exist. Instead, you will find some kind of a

continued on page 74

* Please note that this list appeared last month but is listed here again to aid understanding of continued discussion on disks.

*Please note that this list appeared last month but listed here once more to aid understanding of continued discussion on disks.

LIST 1. 5.25" DISKETTE TEST RESULTS*

TEST CONDITIONS:

USED DRIVE:- TEAC 55BV-U COMPUTER:- SANYO 555-2

TEST TRACK:- TRACK 39 DISKS:- FORMATTED WITH NO FILES

BRAND	(DATE)	MOTOR CURRENT	OUTPUT LEVEL	FLUCTUATION	POLISH	FLATNESS
3M	(1981)	130 mA	290 mV	16 mV	G	G
3M	(1983)	137	331	14	VG	VG
OPUS	(1983)	104	326	8	M	M
IBM	(1984)	192	325	10	VG	M
OPUS	(1985)	139	338	5	VG-E	G-VG
DLIFE	(1985)	110	286	28	M	M
MAXELL	(1985)	123	322	16	M	E
FUJI	(1985-1/2)	141	299	2	S	E
KODAK	(1985-1/2)	143	337	18(2 DIPS)	G	G
PINN.	(1985-1/2)	159	328	15	G-VG	B
SCOTCH	(1985-1/2)	112	315	10	VG	G

NOTE:

1. MOTOR CURRENT IS THE AVERAGE OF FIVE DISKETTES TESTED.
2. OUTPUT LEVEL IS MEASURED AT THE OUTPUT OF ANALOG HEAD AMPLIFIER.
3. HIGH OUTPUT FLUCTUATIONS SUGGEST CENTER HOLE SEATING PROBLEMS BESIDES MAGNETIC COATING CHARACTERISTICS.
4. SURFACE EVALUATIONS ARE ABBREVIATED AS "B" FOR BAD, "M" FOR INTERMEDIATE, "G" FOR GOOD (INDICATION OF MINIMUM DD QUALITY), "VG" FOR VERY GOOD, "E" FOR EXCELLENT, "S" FOR SUPER.
5. MOTOR CURRENT FOR A PARTICULAR DISK TENDS TO DECREASE AFTER FEW HOURS OF CONTINUOUS DISK ROTATION.
6. A SMALL CHANGE HAS BEEN ADDED TO THIS LIST, JANUARY 1986.

The Game of 'N':
Can You Beat Your Computer?

by Dr. Michael W. Ecker

A few years ago, somebody introduced me to an interesting game. A bit later, I made a computer version of a more general such game. Now it is just one program of my Magic Math Plus software collection of computer and math recreations, puzzles, programs and challenges. With minor changes, I offer it here for your own enjoyment. This particular program is amusing in seeing the spaghetti code, but I keep it that way to help conceal the computer's strategy. (Good excuse, huh?)

But I was mentioning strategy. The thing is, you see, you can't beat the machine! Unless, of course, ...

The Rules of Game of N

Although the rules are included in the program, let's go over them here. First, you and your oponent pick a "target score." What if you don't have a human opponent? Then play with your computer. The program will allow you to play against either a human or the computer. Moreover, if you play the machine, the program will allow you to decide whether to have the computer start playing logically right away (by pressing capital L when so prompted), or to play somewhat randomly (press capital R). The latter will allow you a little breathing time to figure out the strategy before the computer gets its chance to pulverize you.

Not scared off yet, eh? Well, after you have your score picked, with you picking the score if the opponent is a machine, the idea is that you and your opponent take turns. During each turn, you pick a number from 1 to 6, inclusive, as does your opponent. The program will check for improper inputs, so there is no chance of forgetting this rule. The computer will keep track of the total of all the numbers used in each turn.

For instance, suppose the target score is 40 and two humans are playing using the program or keeping score mentally. If player #1 picks 3, the total is set to 3. If player #2 now picks 5, the total is now 8 (from 3 + 5). If player #1 picks 5, the total now is 13. Players continue taking turns, picking a number each time and keeping track of the running total. Whoever makes the total hit the target score of 40 picked at the beginning is the winner. In the example just given, if the target were 13 instead of 40, player #1 would win, since his or her total is 13.

In a game against the computer, the computer goes first. Whether or not this is an advantage depends upon the target score, although I will tell you that about 85.7% of the time it does benefit the machine.

The program here will run as is on any MSDOS computer. With suitable changes, it will run on a TRS-80 Model 3 or 4; most of these involve converting the LOCATE statements to PRINT @ statements.

If you have a Sanyo 550 or 555, IBM or compatible (Tandy 1000, 1200, 2000, Compaq, etc.), or TRS-80 Model 3 or 4, and you would prefer not to type in the program, you may obtain it by sending a blank disk and $5 along with the name of your computer. You may also obtain it as part of a collection of programs in menu-driven format. Magic Math Plus sells for $27.50 for 20 programs for the Sanyo or MSDOS version, or $37.50 for the 40-program double volume for TRS-80s. Make checks payable to Recreational Mathemagical Software at the address below. Please note that the Sanyo and TRS-80 versions come on a self-booting disk for completely automatic operation. The generic MSDOS version includes information on transferral to your own system disk.

Remember, I will also answer questions of a relevant nature or send further information if you include a self-addressed, stamped envelope. Write:

Dr. Michael W. Ecker
c/o *Computer Shopper*
Titusville, FL 32781

P.S. Those of you would like this sort of computer recreation will be interested in the Recreational and Educational Computing Newsletter, $16.95 per year for six issues. Write me and include a self-addressed stamped envelope if interested, regardless of your computer make, and I'll see that you get the material.

I'll look forward to hearing your comments, questions, suggestions and improvements. While I may not confine my writing to this column, I will try to respond to reader suggestions in future columns, as well as look at commercial software for various computers, including the Sanyo 550/555 series. Until next time, the, enjoy! ●

```
PROGRAM TO PLAY THE GAME OF N WITH COMPUTER OR FRIEND.
COMPUTER WILL KEEP SCORE IN EITHER CASE.  ENJOY!
Copyright, Dr. Michael W. Ecker and Recreational Mathemagical Software , 1986.


10 CLEAR:S$=STRING$(19,42)
20 CLS:LOCATE 6,32:PRINT S$:LOCATE 7,32:PRINT"* THE GAME OF 'N' *";:LOCATE 8,32:
PRINT S$;:LOCATE 16,5:PRINT"RECREATIONAL MATHEMAGICAL SOFTWARE          (C) 1986
 DR. MICHAEL ECKER".
30 FOR J=1 TO 1500:NEXT J
40 CLS
50 FOR Z=1 TO 300:NEXT
60 CLS:PRINT
70 PRINT"     THE OBJECT OF THIS 1 OR 2-PLAYER GAME IS TO BE THE"
80 PRINT"     FIRST TO PRODUCE A TOTAL OF EXACTLY N (THE TOTAL "
90 PRINT"     THAT PLAYERS AGREE TO PLAY FOR).  PLAYERS THEN "
100 PRINT"     TAKE TURNS DURING EACH OF WHICH A NUMBER FROM 1 TO 6"
110 PRINT"     IS PICKED.  A RUNNING TOTAL IS KEPT BY THE COMPUTER."
120 PRINT:PRINT"     THE PLAYER WHO MAKES THE TOTAL EQUAL TO N WINS."
130 PRINT:PRINT"     Note: The computer will check for improper inputs."
140 PRINT:INPUT"     PRESS <ENTER> WHEN YOU ARE READY TO CONTINUE";X
150 CLS:INPUT"WHAT TOTAL SCORE DO YOU WISH TO PLAY FOR";N
160 IF N<=0 OR N<>INT(N) THEN 150
170 DIM A(INT(N/2)),B(INT(N/2))
180 CLS:PRINT"DO YOU WANT TO PLAY AGAINST THE COMPUTER?":PRINT"IF YES, TYPE AN U
PPER CASE C AND THEN PRESS <ENTER>.":PRINT:PRINT"IF NOT, HIT <ENTER>.":PRINT:PRI
NT"IF YOU DON'T TYPE C, IT IS ASSUMED THAT TWO HUMANS ARE PLAYING."
190 INPUT M$:CLS:IF M$="c" THEN M$="C"
200 PRINT:PRINT:PRINT"One last word before playing... There is a definite strate
gy"

210 PRINT"that will ensure victory. After playing a few games, see"
220 PRINT"whether you can find it.":PRINT
230 PRINT:PRINT:INPUT"HIT <ENTER> TO CONTINUE...";XX$
240 IF M$="C" THEN CLS:PRINT"THE MACHINE WILL PLAY AS PLAYER #1":PRINT"DO YOU WA
NT THE MACHINE TO PLAY SOMEWHAT RANDOMLY":PRINT"(TYPE UPPER CASE R.? ...  OR LOG
ICALLY (TYPE UPPER CASE L)?":INPUT N$:IF N$<>"L" AND N$<>"R" THEN N$="R"
250 CLS:LOCATE 1,8:PRINT"PLAYER #1":LOCATE 1,28:PRINT"PLAYER #2":LOCATE 1,48:PRI
NT"TOTAL"
260 LOCATE 1,57:PRINT"(";N;")"
270 I=0:T=0
280 I=I+1:PRINT""
290 J=I
300 IF J>10 THEN J=J-10:GOTO 300


310 LOCATE 13,50: PRINT "      ":LOCATE 14,1:PRINT"
                        ":LOCATE 13,5:PRINT"PLAYER #1 -- PICK A NUMBER (1,2,3,4
,5, or 6)";:IF M$="C" THEN GOTO 520:ELSE INPUT A:C=A:GOSUB 460:IF Q=21 THEN 310:
ELSE A(I)=A
320 ZOG%=64*J+11:GOSUB 630:PRINT A(I);
330 T=T+A(I):ZOG%=49+64*J:GOSUB 630:PRINT T:IF M$="C" AND T=N THEN LOCATE 13,1:P
RINT"                                                    ":LOCATE 14,1:
PRINT"       SORRY, I WIN THIS ONE!":FOR Z=1 TO 1000:NEXT Z:GOTO 430
340 IF T=N THEN LOCATE 13,1:PRINT"
          ":LOCATE 14,1:PRINT"          CONGRATULATIONS PLAYER #1 -- YOU WIN!
        ":FOR Z=1 TO 1000:NEXT Z:GOTO 430
350 IF T>N THEN 420
360 LOCATE 13,50:PRINT "      ":LOCATE 14,1:PRINT"
                      ":LOCATE 13,5:PRINT"PLAYER #2 -- PICK A NUMBER (1,2,3,4,5,
 or 6)";:INPUT B:C=B:GOSUB 460:IF Q=21 THEN 360:ELSE B(I)=B
370 ZOG%=64*J+31:GOSUB 630:PRINT B(I);
380 T=T+B(I):ZOG%=49+64*J:GOSUB 630:PRINT T
390 IF T=N THEN LOCATE 14,1:PRINT"
          ":LOCATE 14,1:PRINT"          CONGRATULATIONS PLAYER #2 -- YOU WIN!
        ":FOR Z=1 TO 1000:NEXT Z:GOTO 430
400 IF T>N THEN 420
410 GOTO 280
420 CLS:PRINT "YOU GOOFED.  TOTAL IS NOW ";T:PRINT "( OVER"N;").  START GAME AGA
IN":PRINT:PRINT:PRINT
430 FOR DLAY=1 TO 1000:NEXT:PRINT:PRINT"TYPE 'P' AND TOUCH <ENTER> TO PLAY AGAIN
; OTHERWISE PROGRAM WILL END.":INPUT X0$
440 IF X0$="P" OR X0$="p" THEN RUN
450 END
460 Q=0:REM' *** INPUT ERROR TRAP SUBROUTINE
470 FOR K=1 TO 6
480 IF C=K THEN Q=0:ELSE Q=Q+K
490 NEXT K
500 IF Q=21 THEN PRINT"     YOU MAY ONLY PICK FROM 1,2,3,4,5,6.":FOR Z=1 TO 1500:
NEXT Z
510 RETURN
520 A=INT(7*RND)
530 IF A=0 THEN 520
540 IF N$="L" THEN A=N-7*INT(N/7):IF A=0 THEN A=INT(7*RND)
550 IF A=0 THEN A=INT(7*RND):GOTO 550
560 IF I=1 THEN A(1)=A:GOTO 320
570 IF I>1 AND N$="L" AND N<>7*INT(N/7) THEN A=7-B(I-1):A(I)=A:IF A=0 THEN 570:
    GOTO 320
580 IF I>1 AND N$="L" AND N=7*INT(N/7) THEN A=N-T-7*INT((N-T)/7):A(I)=A:IF A=0 T
HEN A=INT(7*RND):A(I)=A:IF A=0 THEN 580
590 IF I>1 AND N$="R" AND T<N-13 THEN A=INT(7*RND):A(I)=A:IF A=0 THEN 590:ELSE:
ELSE IF I>1 AND N$="R" AND T<N-7 THEN A=N-7-T:A(I)=A:IF A=0 THEN 590
600 IF T>N-7 AND T<N THEN A=N-T:A(I)=A::ELSE IF T=N-7 THEN A=INT(7*RND):A(I)=A:
IF A=0 THEN 600
610 GOTO 320
620 '************************************************
    '* R65030.ASC - Calculates PRINT@s with variables.*
    '************************************************
630 ZAG%=INT(ZOG%/64):ZOG%=ZOG%-64*ZAG%+1:ZAG%=ZAG%+1:
    LOCATE ZAG%,ZOG%:RETURN.
```

The Silver Box
continued from page 73

flexible but hard painted surface around the center hole. I would not hesitate to allude the advertising words for this nonexistent hub ring as somewhat fraudulent. I wish they would stop using the "Super Hub Ring" name on the box.

The result of this plastic coating around the center hole is not certain yet. It it withstands daily use for, say, three years, I would accept it as a better alternative to the bonded hub rings for the sake of increased accuracy in seating of the disk on the hub as clearly demonstrated in the List 1.

This brand is my choice Number One although output level is in the lower side among tested. You should note, however, that the seating accuracy was the best among all the diskettes tested.

The 3M Diskettes

Do not confuse the industrial grade 3M brand diskettes with the Scotch brand of the 3M Company. In the so called Bernoulli Box, the floppy hard disk is rumored to use a 3M recording media. This brand (the 3M but not the Scotch brand) is my second choice together with the OPUS brand of disks. It is also reasonably priced. The recording surfaces of the 3M brand has more or less no large streaks or dimples as all high quality diskette should. I assume this brand of diskettes is meant primarily for the computer industry.

The Scotch Brand of 3M

The Scotch brand diskettes are distributed by the Consumer Products section of the 3M Magnetic Products Division and are targeted toward home computer market. Although this brand of diskettes has good polish to the naked eye, the diskettes generally have more streaks and ridges on the recording surfaces than the 3M brand diskettes. The disks in a box are less uniform than the 3M brand in regard to surface conditions. The Scotch brand diskettes have slightly rougher, scarred, burnished surfaces with some irregular streaks. This brand is in my third choice category and used for all 46 tpi applications.

The OPUS Diskettes

This low cost brand is my second choice with the 3M brand. This brand of disks are apparently made in the same plant as the Wabash Magnetics' diskettes. I called the company to clear this point since the advertising declares that "...manufactures ALL of its own magnetic media."

The main office could not answer my question and referred me to one of the branch offices which took down my name. This is a little strange. I specifically told them that I wanted to ask some technical questions. Was I the ball in their ball game? My guess is that they are afraid to tell the truth, having been a subjugated supplier of smaller size and perhaps contracted not to tell. Although the company vehemently denies my allegation in subsequent telephone conversations, the similarity of the two products are simply uncanny.

Unlike the situation prevailing in Japan, many of the 80 or so manufacturers in the United States do not manufacture the media themselves but rather use magnetic media made by other companies. The OPUS representative told me there are 12 companies in the US who make the media.

Some of the OPUS disk surfaces are quite good and have very good polish next only to Fuji disks.

The problem with this brand is that the disk quality you get differs noticeably nearly every time you make a purchase. I found particularly good disks in one of the boxes I bought and this box of disks are all used in the 96 tpi for-

continued on page 163

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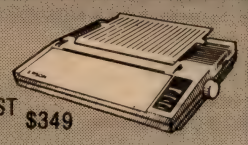

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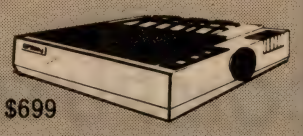

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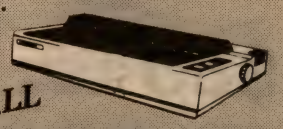

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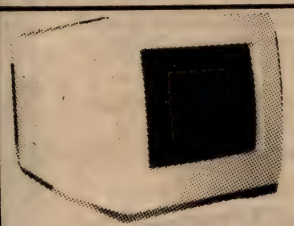

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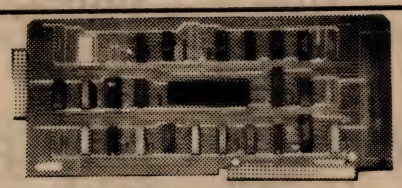

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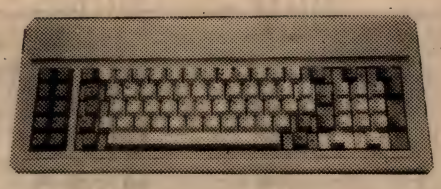

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TEXAS INSTRUMENTS

Randy's Ravings

by Randy Holcomb

Hello and welcome back, hope you all had a nice and safe holiday season. Let's take a look at what's happening in the TI world.

9938 Compatibility. A few issues ago we started to go over the 9938 VDP for the 99/4A and its implications for improved video. It is 100% *software* compatible with the present 9918A, but it is NOT (repeat, NOT) 100% hardware compatible-i.e., you cannot just plug the 9938 in place of your 9918A and expect it to work. As a start, the 9938 is a shurnk 64-pin DIP versus the standrad 40-PIN DIP for the 9918A (.1" pin spacing on the 40 pin package versus package.) It IS possible to come up with an adaptor board that will map the 64 pins into the 40-pin package but some serious drawbacks are that motherboard modifications will be necessary in order to fully implement all the modes supported by the 9938. Also, an RGB monitor would be required to fully exploit all the detail that the 9938 is capable of yielding. Myarc will more than likely incorporate the 9938 in their new computer (when/if it comes out) and other people are looking into making add-on PBox cards or side-mount cards using the 9938.

New products: Jim Peterson of **Tigercub Software** has released **Nuts and Bolts 2,** a follow-up to his Nuts and Bolts disk. The price for number 2 is $19.95, for both the first and latest disk its $37 postpaid. Check the TI Software ads section in the *Computer Shopper* for his address. And while I'm talking about Jim, I think we ought to thank Jim for letting many of the TI User's group's print his "Tips from the Tigercub" series in their newsletters - many of the newsletters I have received have contained the Tips and in some cases make up most of the content of the newsletters.

Speaking of newsletters, if you have something of interest that you would like to see shared on a national level send it our way here in care of the magazine. Conversely if you would like to reprint a particular "Randy's Ravings" article drop me a line here at the *Computer Shopper* to request permission to reprint a particular column. (Just like software, this column IS copyrighted!)

C99 — It's Implications. A version of the C language is now available for the 99/4A from **Clint Pulley, 38 Townsend Ave., Burlington, Ontario Canada L7T 1Y6.** It is user-supported software and a $20.00 donation is suggested.

The version of C99 is based on the small-C compiler written by Ron Cain in the Dr. Dobbs Journal No. 45 (May 1980). This verion, according to the author, was originally constructed on a DEC PDP11/60 using Decus-C and was later ported (after some 30+ revisions) to the TI. Most of C99 is written in C, so it is self-compiling, which leaves the door wide open for many future modifications and extensions to the language. This C compiler produced assembly source code as its output and in addition can handle in-line assembly code. Code generated by this C compiler is claimed to be fully-relocatable and can be saved as program-image files.

This C compiler may have proved to be just as important a step in keeping the 99/4A alive as releasing TI Forth to the user community. Since the facilities are present for adding lanugage extensions it shouldn't be too hard to add access to the many GPL-based routines hiding in the console (Floating point, interrupt processing, display formatting, etc.) or to add custom features to the compiler. The BIG things that are exciting about this compiler is that it generates assembly source (which means object code after you assemble it) and that the language presented in this version will allow a wide variety of C programs written for other machines to be ported over to the 99/4A. I have an incomplete set of the distribution files, I hope to have the rest of the files necessary in time for next month's column to do an in-depth analysis and review of this system, but if half of what I have seen in the docs I presently have hold up, this will keep machine going for quite a while!

Another XBasic product you may want to look at is PCKEYS from **Techni-Graphics** (443 Perrie Drive #302, Elk Grove Village, IL 60007). This utility allows you to define the CTRL keys to do whatever function you need, and includes a screen-dump utility for Epson/Gemini-compatible printers and a catalog program utility. Suggested price for PCKEYS is $22.50.

The Future for TI: That's a good question. The 99/4A, surprisingly, has managed to keep itself and its users (and me) busy with new software (albeit fewer releases) and some new peripherals (Millers Graphics Gram Kracker, Top Radio Supply's 16/32 memory card, CorComp's Triple-Tech as examples). My editor is still surprised that we get TI traffic — at times so am I, but I have come to the realization that people are making do with what they have and aren't all that ready to jump onto the next gee-whiz-bang computer that comes down the pike. As for the computers that TI still makes, sales of the Business Pro are moving along, and sometime soon we'll see the first Unix-based machine from TI, more than likely based on the 32000 series. Reports are saying that TI is feverishly working on conversion utilities that will serve as a bridge from the current 990/Business system series over to the Unix machine to ease transition — the question as to whether the 990/Business System series is dead is certainly at issue — it's wait and see time.

What does the future hold? Read next month's *Computer Shopper* and find out! ●

PROfessionally Speaking (about the TI Pro)

by Dick Evans

The events of the past few months seem to indicate that Texas Instruments, Inc. is unaware of the fact that their secret entry into the personal computer marketplace has been discovered by thousands of individuals and more than by just a few companies. Everything coming from the corporate Public Relations Department touts TI's advances in chip making and leading edge software development. Personally, I think this is great. I see a bright, solid future for my personal computer. However, all of these advances and improved products don't really meet my daily needs. To find satisfaction for these I must rely upon third party manufacturers and developers. Now, and in the articles to come I am going to try and introduce you to some of the things that TI is doing.

For both our benefits, I will keep it simple. I am also going to be discussing some of the third party hardware and software that is designed for the TIPC or includes the TIPC in its compatibility listing. The TI information will be coming from their publications and the TI Public Relations office, as well as personal contacts I have developed over a period of time. The third party product information will be coming from various resources. A portion of this will be freeware and user supported software that is being developed by individuals and small companies that do not have large advertising budgets. In many cases the only true investment is in the code.

Two messages are coming from TI in loud, clear tones and multi-page, color graphics. One is "we need dealers," not storefront hardware pushers but, technically sophisticated solutions marketers. The other is "we are big in AI." (AI being artificial intelligence, for those of us who weren't sure.) What does this push for dealers, ("VARs" according to TI,) mean to those of us who already have our microcomputers? A VAR is a value added reseller. By definition this means that you, the end user, is buying more than just the basic hardware from the dealer. Most of the VARs I've met are marketing very good, proprietary software to a well defined vertical market. They occupy dignified business offices in professional complexes and along with being somewhat hard to find, do not really know a great deal about applications outside their own area of expertise. Another limitation they seem to share is a lack of third party product knowledge. So we are somewhat dependent on the local storefronts that sell software. I don't think that anything will be accomplished by the retelling of the various horror stories users have related because of those visits. Our next adventure of information is magazines. Until recently, those could have been counted on one hand with most of the digits at rest. Some improvement is visible. Another information resource is the user group. TI, Inc. supports an international users group organization that seems to share the corporate desire to remain both silent and secret. Other than their once monthly magazine, which is valuable and contains advertisements for TI compatible products, they are unknown.

Telecommunications and independent users groups appear to be our most viable resource for information and product knowledge. There are a few local and a national bulletin board service that supports the TIPC. There is a newly formed national users group that may become a valuable and viable resource. Much of that will depend on the response they get from their first membership invitation mailing. I'll put the contact information for the various groups at the end of this article. Let's move on.

Artificial Intelligence (AI) is the "buzzword" for a developing technology that is computer based. It does not replace anything. It is an addition to and an extension of the basic capability of a digital computer. You must remember that the "digital" in a computer

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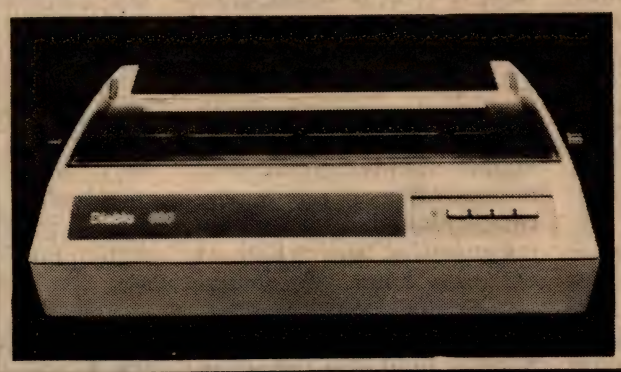

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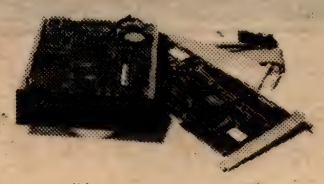

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TIMEX-SINCLAIR

Timex-Sinclair Survival Column

by Mark L. Fendrick

This month marks the second anniversary of the Timex decision to exit the home computer market. Many of us thought that it would all end then, but, happily, we are still here and stronger than ever. When Timex was still around, there was very little third party development going on, but now it is these independents which continue to suport the Timex/Sinclair line. For a while this past summer it seemed as if that support was about to dwindle to nothing, but Zebra Systems has made up for all lost time with a number of very exciting new releases. So to mark this infamous anniversary I present you with these new offerings.

The first release is actually a new, updated and less expensive version of my most often used software — MSCRIPT. Those of you who have been reading this column for some time know that my one "problem" with MSCRIPT was the inability to SAVE the files to my A&J microdrive. The first addition I noticed in this version is just that ability! With the original, once the program was started you could not exit to BASIC, and the software routed all files to a nonstandard cassette SAVE, with no other options. Since this was a nonstandard header, adding the "@" character did not send the file to your microdrive or other alternate mass storage device. In this new version, the menu option which would normally restart MSCRIPT now sends you back to the newly written BASIC program. Back to BASIC, (and the normal 32 column display) you are presented with the first of three new menus. This is also the menu which you are shown upon LOADing the new MSCRIPT software. The options presented here are;

1: RETURN	6: PRINTER
2: WARM START	7: COLOR
3: COLD START	8: CLICK
4: MEMORY	9: FAT
5: SAVE/LOAD	0: STOP

The first three options are the choices you would use to go from BASIC to the actual MSCRIPT program. Option number #1 would be used to return to the MSCRIPT program during a session in which you have entered text and subsequently had reason to return to BASIC. The second option would be the one to use if you have LOADed your text file before entering the program itself. This will preserve the file you have entered. If you choose the third selection, the program would start with its initialization, wiping out any text you may have LOADed. This third option replaces the RESTART MSCRIPT found on the original MSCRIPT COMMAND MENU.

The fourth option allows you to view and change any memory address. This is for any future modifications and/or patches which might become available for this program.

By selecting choice number five, you are presented with a menu of SAVEing/LOADing options. SAVEing, LOADing and APPENDing files are all available as they are with the original MSCRIPT, but this version also allows you to SAVE a marked block of your current document. After the SAVE has been accomplished, you are asked if you wish to VERIFY your SAVE. I find this to be a very important addition. With the original version I used to VERIFY by using the APPEND feature. If the file was longer than one-half the full size of the buffer, I was unable to do this. In addition, you have the option of making a back-up copy of the software itself. When you choose this option you will be asked if you want to SAVE it to cassette or A&J microdrive. It will be SAVEd and VERIFYed to the A&J just as simply and automatically as to cassette. In order to SAVE a text file to the A&J microdrive all you have to do is add the usual "@" character plus file number before the filename, and the file is now SAVEd with a standard header — definitely a plus when interfacing with other programs, such as MTERM II.

Option number 6 on the main menu will allow you to customize MSCRIPT to your printer interface — AERCO, TASMAN, A&J, or even the T/S 2040 printer! Two other selections you may make are 1) whether or not the program will automatically send a linefeed after each carriage return; and 2) a block print option. Neither of these were available with the original version, so I had to set all of my other software/driver combinations to match the no linefeed situation of the original, causing problems with many other programs. Now I can configure my system to be compatible with the more standard situation.

Option seven allows you to set the paper/ink combination; number eight activates a small click with each keystroke; and option 9 toggles between a thin character set and one which is slightly thicker. The final option (0) stops the program so you can list and modify anything you feel needs it.

The CAPS SHIFT/BREAK combination has been replaced by SYMBOL SHIFT/BREAK (which worked with the original as well). The only major drawback I found with this new version is that in order to accommodate the improvements, the buffer has been reduced from 18439 bytes to 16319 bytes — a loss of 2120 bytes. A small price to pay for those many improvements, and with microdrive capability, a second file is so easy to SAVE on the same wafer that the reduction in the size of the buffer is only a small matter.

A second new product I have had a chance to try is the GREETING CARD DESIGNER. Similar to a very popular program for that other computer, you can make use of a number of different type fonts and graphics (supplied) to create your own personalized greeting cards for any occasion, using your 80 column printer. The program comes in three parts — a card designer, a library of graphics (I received 22), and a graphics designer for those who want to design their own additions to the library.

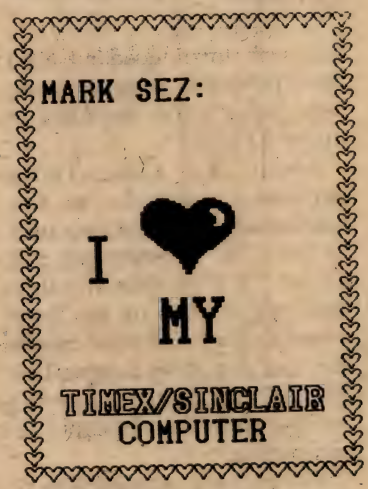
The first thing I did was to transfer the card designer and graphics designer to on microwafer, and the library to another. This was very simple to accomplish, and only required minor modifications to the original program. As with all of their software, ZEBRA has provided a back-up option right from the menu, making the transfer a snap. (Pressing BREAK during the normal cassette SAVE indicates the line where the SAVE routine exists.) Right now I have 31 graphics on a 35 foot wafer, with room for some more.

To create a greeting card, you LOAD the card designer, and are guided through the procedure. I suggest that the very first thing you do is to set your printer/interface combination, or else you may find that you have designed your card, but are unable to print it. This software supports seven printers (Epson RX/FX; Gemini 10X/SG10; Memotech DMX80; Panasonic 1090/1091; Spirit-80; Seikosha GP250; and Prowriter 8510) and four interfaces (AERCO; Tasman-b; Tasman-c; and A&J).

Next you will choose to design either the cover or inside of your card (the procedure is identical). In designing your card you may choose one of eight borders. For your text you have a choice of sizes (small and large), fonts (filled or open), and justification (right, left, or centered). Which of these options you choose depends on the type, size and placement of your graphic. You select the graphic from the menu, choosing from the graphics in your library. Once loaded, you have a choice of two sizes. The small graphic can be placed in any number of compartments with in a six by six grid, while the large graphic will fill a three by three grid.

By going through these procedures for both the cover and inside of your greeting card, you have designed your own creation, ready for your printer. The card prints as shown in the illustration — and upside down — ready to be folded, inserted into an envelope and sent on its merry way. You may also print more than one copy of your card just by specifying how many copies you want. If it is a particularly good design, you may SAVE it from the menu for future use.

While the package comes with a number of predesigned graphics, you may want to design your own. The graphic designer portion of this software allows you to do just that. When you load this portion of the software you can design your graphic on a 32 by 56 pixel grid. As you turn the individual pixels on or off, you can immediately see the result in an actual size window on the same screen. You can modify your graphic (or any of the existing graphics) at any time to suit your needs.



If this program proves popular, look for a poster and banner designer to follow. Greeting Card Designer is great for those of us with limited (or nonexistant) artistic talents, since the graphics come with the software.

When the T/S 2068 first appeared, many of us were excited about the possibility of the 64 column display. When it was released we were disappointed to find that in order to use this capability, it required some rather complicated machine code. In fact, the manual did not even cover this, and the tech manual (which was poorly reproduced, and not generally available) was fuzzy on the matter. Very few programmers took advantage of this display mode for this reason, and only MSCRIPT and TEXTWRITER 2000 used the true Timex 64 column mode. TASWORD advertised a 64 column mode, and even offered TASWIDE, a utility

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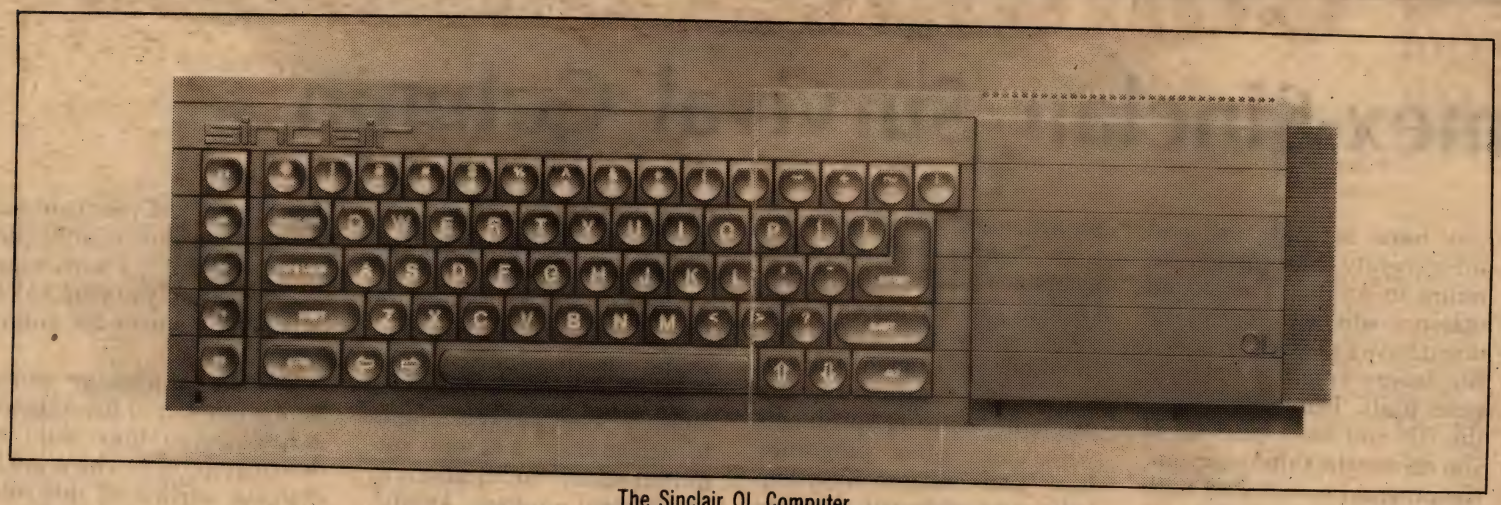
The Sinclair QL Returns



The Sinclair QL Computer

At the beginning of 1980 Clive Sinclair started selling his first computer, the ZX80. The initial purpose was to take the technology of the day and make it affordable to everyone. By pushing that technology to it's limits, the ZX80 exploded the limits of price/performance: — a full powered computer that sold for less than $200.00.

A year later, Sinclair Research introduced an even more powerful computer at an even lower price: the ZX81 at under $150.00.

About that time, Timex became involved in the marketing of Sinclair products in the U.S. bringing out the Timex TS-1000. For the first time we started to see mass merchandisers invovled in the low end computer range. The TS-1000 was a huge success involving millions of people in computing.

Timex took Sinclair's next generation computer, the Spectrum, and sold it across America calling it the Timex 2068. For the first time, full color and sound were available for under $300.00.

Before this relationship ended in 1984, Sinclair, with Timex, became one of the dominant forces in personal computing, with sales of almost 3 million units worldwide, more than any other company in the industry at that time.

For his efforts, Clive Sinclair was knighted and became Sir Clive. The entry level computer market looked rosey, and the next generation of machines was being rumored about, clearly, the momentum was with Sinclair.

And then, suddenly, Timex called its quits.

Timex never gave any definite reason for pulling out except for hints of financial woes. Most observers speculated that they were unwilling to make a long term commitment to the support of the machine. They discovered that computers require massive, long term, expensive support. So without warning, things ground to a halt, and there was silence.

Apart from the hardcore users who had cut their teeth on Sinclair computers, and the handful of tiny companies who continued support, the general public heard nothing. Publications dedicated to Timex/Sinclair disappeared over night, as did the products on the dealers shelves.

In England, and the rest of the world, the enthusiasm, however, continued unabated, and it was into this arena that Sinclair's newest product was released in 1984, the Sinclair QL, named for "quantum leap," the QL represented Sinclair's first 68000 based computer. With 128K of memory, startling graphics in an 85 column display, full multi-tasking, bundled in W/P, graphics, spreadsheet and database management software, all for less than $500.00, the QL looked very interesting to say the least.

Whether this machine would make an Atlantic crossing was the subject of much speculation, but hope burned bright in the hearts of Sinclair die-hards.

Early, unpolished U.K. versions were quietly reviewed in the U.S. publications, but the proposed American release seemed illusive, at best, as Sinclair themselves knew much refinement was needed for the QL to gain wide acceptance here. Finally, just as the QL was ready to make it's U.S. debut, Sinclair cut the price of the British counterpart almost in half! The Wall Street Journal carried the news to consumers in the U.S., who, waiting with $499. in hand, immediately wanted to know: would there be a similar price reduction here? After a 3 month delay, the answer was "yes." So now, at last, we have a genuine American version of the Sinclair QL in hand with a suggested retail price of $299.00. The FCC has given their approval for sale of the QL.

Sinclair Research has taken their "anything is possible" philosophy, which accounted for much of their initial success in this country, and applied it to the QL.

QL power starts with the Motorola 68008. It's 32-bit architecture is already a favorite choice of software designers for speed and flexibility and this ensures the QL will not become outdated in the medium and long term. Sinclair has squeezed even more power out of the 68008 by freeing it from certain tasks — routinely and inefficiently — handled by the main processor in some other computers. A second processor, an Intel 8049, controls the keyboard, generates the sound and acts as an RS-232C receiver. Two Sinclair custom chips control display, memory, the microdrives, a real-time clock, local area network and RS-232C communications.

To take still greater advantage of the power of 32-bit architecture, Sinclair has designed a whole new operating system. Residing within the machine's 32K ROM is QDOS, a single user, multi-tasking, time-sliced system using Sinclair Super-Basic as a command language. Multi-tasking allows several programs to be run simultaneously, a feature normally found on computers costing 10 times the $299.00 the QL lists for. QDOS has fully device-independent input/output so when a program is written on the QL, one merely needs to specify which device is to be used when the program is ready to run.

Anyone familiar with earlier Sinclair computers knows the power of Sinclair Basic. SuperBASIC is even more powerful. It handles strings as neatly as it handles arrays, it is fully procedure structured, its extendable and its execution speed is independent of the program size.

The procedure facility lets you write code in clearly defined blocks. Extendability allows addition of new procedures that will work exactly the same as the command procedures built into ROM. The constant execution speed means that SuperBASIC won't get slower as the programs get larger. Instead, long programs run much faster than with other Basics.

continued on page 184

Timex-Sinclair
continued from page 79

which produced a 64 column display on both the display and the T/S 2040 printer. But TASWORD and TASWIDE did not utilize the built in 64 column mode, but created their own character set which used fewer pixels and produced a fuzzier display which was almost impossible to read on the T/S 2040 printer.

Now accessing the true Timex 64 column display is as simple as inserting ZEBRA's new OS-64 cartridge into your command cartridge port and you are in 64 column mode! The OS-64 is actually a modified operating system for your T/S 2068 computer. For the most part it is identical to the 32 column mode you are used to, and most of your existing programs can be modified to operate with the OS-64.

There are a few things you will have to be aware of however. First of all, the amount of free memory using the OS-64 is 33740 bytes as opposed to 38652 bytes with the standard operating system — a difference of 4912 bytes. This is caused by the additional coding for the features in this mode. In addition, the OS-64 does not support the T/S 2040 printer. This is in line with the fact that most people using a T/S 2068 (and Spectrum for that matter) are using full size printers rather than the smaller thermal printer. (In England, Sinclair has stopped production of the ZX printer.) The OS-64 has a built in Centronics print driver, and supports COPY on Epson compatible printers. The interfaces supported are the AERCO, Tasman-B, Tasman-C, A&J, and Oliger, or actually any other interface you may have connected. Instructions are included to set-up for any interface not listed. Control codes may be sent, and the design of the output may be customized.

Because of limitations in the Timex designed 64 column mode, there are a few other trade-offs. FLASH is an inoperable command in 64 column mode, and will cause the program to stop with an error if encountered. You cannot select the BORDER color, but instead it automatically set itself to the current PAPER color. When you set the PAPER color, the INK is automatically set to a complimentary color, and visa-versa. Also you cannot set temporary (local) PAPER or INK colors — they always change the entire screen. And finally, those LOADing and SAVEing stripes you are so familiar with no longer appear.

Other than those limitations, BASIC is the same in 64 column mode as it is in 32 column mode. The graphic commands, however, will operate as if in 32 column mode.

For all of those who wanted to make use of the 64 column mode, OS-64 is the best way to do it.

The final new offering from ZEBRA is their new ZPRINT-80 Printer Support Package. This supports AERCO, both Tasman, and A&J interfaces with LPRINT output, LLIST output, Normal size screen COPY and full page grey scale color screen COPY. (Screen copy routines support the printers listed above for the Greeting Card Designer. The tape comes with four versions of the driver software; a high memory and low memory version for both the T/S 2068 and Spectrum computers.

For more information and a copy of their latest catalog write to ZEBRA SYSTEMS, INC., 78-06 Jamaica Avenue, Woodhaven, NY 11421. (718) 296-2385. ●

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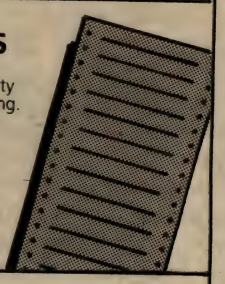

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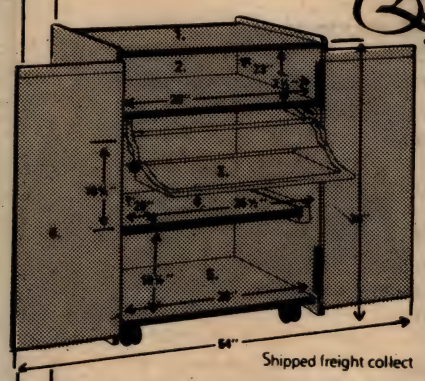

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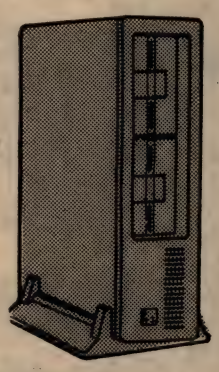

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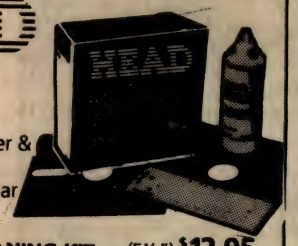

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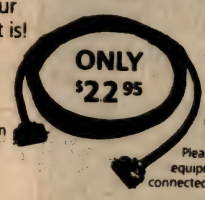

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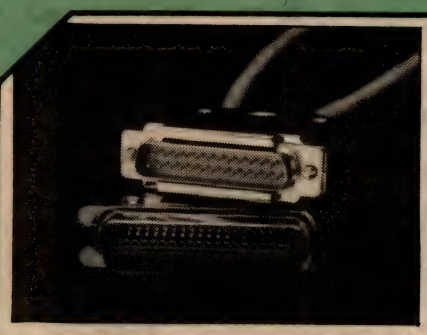

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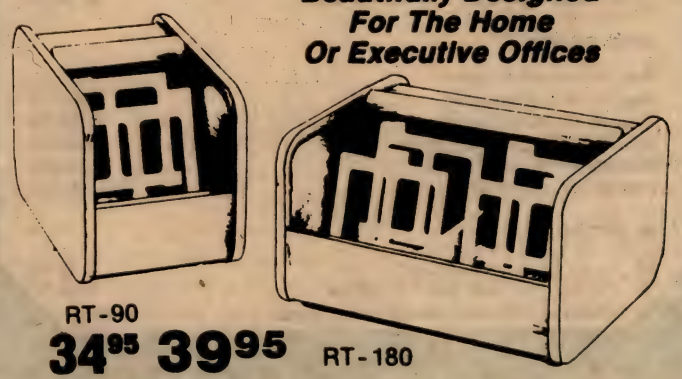

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by Ted Drude

The New CP/M Solutions: Eight Bits on a Budget

If you've ever been interested in getting access to the mountains of old (and cheap) 8-bit CP/M software, you should be interested in this article. We are going to review some inexpensive, yet powerful, ways to add 8-bit CP/M computing your PC-compatible computer (like a H/Z-150 or other PC-clone). Some of these solutions are less than $100!

With the rise of MS-DOS and 16-bit computers, a lot of old (but good) software written for the Intel 8080 gor "left behind." Because of the vast amount of 8080 software still around, especially CP/M business and public domain programs, there's been a fair amount of interest, interest in "retro-fitting" MS-DOS machines to run CP/M-80. Until recently, that has required the addition of an expensive CPU add-on card and a specially modified copy of CP/M. (Dual 8/16 bit processor machines, like the H/Z-100, have been the exception.) These 8-bit "downgrade" packages have usually cost from $500-800. Needless to say, adding CP/M compatibility hasn't been high on most MS-DOS user's lists.

Now, there are some considerably less expensive ways to enter the "cheap and fun" world of CP/M compatibility. The "secrets" to this inexpensive dual-mode capability are the new NEC "V" chips and "CP/M emulator" programs for MS-DOS. We're going to look at each of these in detail. In addition to seeing how the "V" does its 8-bit tricks, we will review several of the "software links" between CP/M and MS-DOS. These products are bringing the price of 8-bit compatibility within the potential reach of every PC-compatible owner.

The New NEC "V" Chips: Details on the Emulation Mode

We introduced the NEC "V" series CPU chip, the V-20/30, last month. They have a lot of technical advantages over their Intel 8088/86 counterparts. In addition to an expanded and enhanced 16-bit instruction set, they also provide high speed 8080 8-bit emulation in hardware.

The 8-bit emulation mode is accessed through the addition of a new 16-bit interrupt instruction mode "BRKEM" - break to emulation mode. An 8-bit program is first loaded into memory and it's execution address set up in the interrupt table. Then the "'BRKEM" instruction is given and the CPU jumps to the 8-bit program.

During the switch from 8 to 16 bit mode and back, the 8080's data registers get "mapped" into the larger register set of the 8088/86. This allows the register set to be used as a simple means of passing data between the two modes.

Once in the 8-bit mode, the "V" chip executes 8080 binary code directly. All normal 8080 instructions are supported. While in the 8-bit mode, 16-bit hardware interrupts are processed transparently. The 8-bit programs can even call 16-bit routines directly from the emulation mode using another new instruction "CALLN" - call native mode routine.

When the 8-bit program wants to terminate, it returns to the 16-bit mode with another instruction "RETEM" - return from emulation mode. The "V" chip then resumes normal 16-bit operation.

Speeding Up The Software Bridge

Although NEC has not released official specs., benchmark comparisons reveal that a 5 Mhz V-20, when running 8-bit emulation, is actually running a slower than 5 Mhz. Some observers have quoted something like a 3 Mhz 8080 equivalence. That's still faster than the standard 2 Mhz 8080 chip.

In most "real-life" applications, the V-20, in the emulation mode, is able to provide very acceptable performance. In one benchmark test I ran, a standard Zenith-150 running a V-20 in emulation mode, outperformed a 5 Mhz Z-80-based Kaypro 4. This particular benchmark had a lot of disk I/O involved, so I believe the V-20's performance advantage was largely due to the higher transfer rate of the Z-150's data bus system. In pure "number crunching" benchmarks, 4 and 6 Mhz Z-80s still have an advantage over a 4.77 Mhz V-20.

8080 Emulation Only ....for Now..

Currently, the NEC hardware emulation is limited to the 8080 CPU. It will not run programs that use "Z-80" only instructions, nor is the Z-80's extra register set supported. During testing, I ran Z-80 code on the V-20, and it invariably crashed to into an endless "hung" condition which could only be resolved with a hardware reset. Although most CP/M software is written to run on either the 8080 or Z-80, some of the latest software runs only on the Z-80. If you absolutely need Z-80 compatibility, the "V" solution won't work for you (yet). There are "software only" emulators, however, that will run Z-80 code (two of which are reviewed later in this article).

(There are some "unofficial" rumors that NEC is considering some type of Z-80 compatibility for the "V" chips at a later date. "Rumors" probably isn't the proper term. "Loose talk" is more accurate. When the "V" series was in the design phase, NEC was in litigation with Zilog over the NEC 780 CPU. That NEC chip was a "clone" of the Z-80, and Zilog was suing over copyright violations. Since then, the litigation has been settled. In an interesting turn of events, Zilog, itself, is now an official "second source" of the NEC "V" chips! The Z-80 compatibility rumor may now have some merit.)

CP/M Emulator Programs: The Software "Link" to MS-DOS

To run CP/M software, you not only need an 8-bit CPU, you also need the CP/M operating system. In the past year or two, several reasonably priced "CP/M emulator" programs have appeared that provide a "CP/M compatible" interface to MS-DOS. These programs are totally legal "clones" of CP/M that provide a close emulation of CP/M's BIOS and BDOS functions. For a fraction of the cost of adding a hardware board and a "real" copy of CP/M, these programs allow thousands of 8-bit programs to run on 16-bit hardware. (One such program is marketed through the Heath Users Group, HUG.) The programs usually run 8-bit software by doing a simulation of either an 8080 or Z-80 CPU on the 8088/86 processor. The main disadvantage to this approach has been slow speed in the CPU emulation area.

Now, several new and/or updated CP/M emulator programs are starting to appear

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X-10 Peripheral Automatic Remote Control Electrical Devices

At the Winter Consumer Electronics Show, **X-10 (USA), Inc.**, introduced a peripheral system for IBM-PC computers which can operate lights, appliances, heating systems, and other electrical devices automaticaly by remote control. The product, **"X-10 Powerhouse,"** can separately control dozens of devices and can automatically change the daily operating schedule of each device.

Powerhouse will be available in computer and electronics stores at a suggested list price of $150. The purchase price includes the programmable interface/controller, software on diskette, and a cable to connect the controller to the computer. The controller is self-powered and, once programmed, can be disconnected from the computer, leaving the PC free for other applications.

According to **X-10** president Peter Lesser, **X-10 Powerhouse** works with the company's **"System X-10"** products, and it is suitable for home, business, and commercial uses. "Compatibility with IBM significantly increases the market for **X-10 Powerhouse.** In additon to the established uses for **System X-10** -- security, per-

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Heath/Zenith
continued from page 85

that use the hardware power of the NEC "V" series microprocessor's 8080 hardware emulation to overcome the speed problems. With low-cost "V" chip appearing on the market in droves, these programs let the hardware take over in the emulation mode. The result is low-cost, high-speed CP/M capability for almost all 8088/86 based MS-DOS computers.

The Reviews: Trials and Tests

I reviewed six packages that provide CP/M 2.2 capability for IBM-PC compatibles (including the H/Z-150). Four of the packages are combination hardware/software systems that use the hardware 8080 emulation mode of the "V" series. (Two other "software-only" emulators are included for comparison purposes.)

Two packages are "software only" emulators that will run on either a standard 8088 or a V-20. These programs not only provide CP/M emulation, they also provide software emulation of an 8-bit microprocessor. They are also included for two reasons. First, one of them provides software emulation of a Z-80 CPU (which the "V" doesn't yet have). Second, they are a good way to compare the relative performance of software vs. hardware emulation.

In addition to providing order information for each program, I have attempted to provide a mini-review to give you my impressions. I ran each program on a Z-150 with a 10 Meg. Winchester, 256K RAM, running at 4.77 Mhz.

In order to test each product, I followed the manufacturer's documentation. I ran a variety of CP/M programs, including both Public Domain and commercial software. Any significant advantages or flaws were noted.

Utility Programs

Three points of interest accompany each review. The first is a listing of any utility programs provided with the software. Several of the packages included a disk conversion utility like "Media master." These programs allow you read and write CP/M formatted 5¼ disks. This speeds up the software conversion process. Some programs also included an Xmodem file transmission utility. This allows you to transfer files using a serial port connection (modem or hardwired). Other utilities were provided as noted.

Terminal Emulation

A second point of interest would be the description of terminal emulation provided by each program. This is important if you are running software written for a specific CP/M computer or terminal. The terminal emulation features varied widely, but almost all programs provided for "ADM3A" terminals (the most generic CP/M terminal type). The ADM3A is also a subset of Kaypro terminal emulation, so most Kaypro configured programs will work fine.

For serious Heath 8-bit users, the H-19 and H-89 are emulated by some of the packages. The best performing H-19 emulation I found was in the "Media Master Plus" and "Acce18/16" packages (both from the same company). The terminal emulation there ran fast and mapped all of the various H-19 function keys to similar keys on the Z-150 keyboard. No other terminal program went that far, although Micro Interfaces "RUN/CPM" might be able to be programmed to handle it. (The pre-programmed "H-19" terminal emulation from "RUN/CPM" wasn't as extensive as "Acce18/16"s.) the "Un/Emulator" package includes a HUG-supplied Z-100 emulator package.

Benchmark Tests

A third consideration of each program includes relative benchmark times. In order to check the performance of each package, I used famous "Sieve of Eratosthenes" benchmark written in Small-C. The time that it took for each emulator package to compile (with the C80. COM compiler), and then execute each program is listed.

All of the V-20 based emulation programs ran the benchmark in the same amount of time (one minute, twenty seconds). Since they were all running "pure" binary code in hardware, that is to be expected. But, there was considerable difference in the compile times, as you can see. This demonstrates that the DOS interface programs have varying efficiencies. (All the "V" emulators, by the way, outperformed a 5 Mhz Z-80 Kaypro 4 in compile times.)

The "software only" emulators took considerably longer in both respects, compile and run, than the "hybrid" hardware/software packages. This is to be expected. When running the "software only" emulators on faster 16-bit CPU (like an IBM-AT or Zenith--200), they should exhibit much better performance. When 80386 machines appear, the software-only programs may prove to be more than a match for the hardware approach of the V-20.

CP/M BIOS and BDOS Emulation Features

Also included in each review is a list of the "non-supported" CP/M BIOS and BDOS calls. No emulator claimed full support of all CP/M calls. Some emulators were more complete than others. This information is supplied to those who are technically interested in the scope of emulation provided by each program.

Summary

One of this year's best bargains is, low cost, high speed, CP/M compatibility by the NEC "V" chip and software emulator programs. It's now possible to have a dual 8/16 bit processor in every PC-compatible computer. With inexpensive MS-DOS machines now flooding the market (including Zenith's own Z-148 and Z-138), low-end 8-bit machines (like Kaypro and Osborne) are probably seeing their last days. Fortunately, their software can live on.

I

Product: "CP/EM"

Description: Software package (V-20/30 optiuonal) that emulates an 8080 or Z-80 (in software), and CP/M 2.2, with utilities. Software emulation runs on PC or AT compatible.

Price: $79.95 - Software Only $49.95 - V-20 chip

System Requirements: IBM PC or AT compatible, 64K RAM, one drive, DOS 2.00

Update Policy: Bug fixes - free: Version updates - $10

Utilities Supplied: Programs included for Xmodem transfer of programs through serial port. Macro file for Microsoft 8086 assembler for 8080 instructions.

Terminal Emulation: Kaypro, Televideo 950, ADM3A, (custom avaiable)

Benchmark Times: Compile - 32 secs. (Hardware mode): Run - 1 min. 2 secs.:(Hardware mode) Compile - 1 min. 57 secs. (Software Z-80 Mode): run - 7 min. 35 secs. (Software Z-80 Mode)

DOS Calls Not Supported: BDOS - 1B, 1E, 1F, (20): BIOS - 18, 1B, 1E, 21, 27, 2A, 30

Sold by: The ICU Group
P.O. Box 10118
Rochester, NY
14610
(716) 425-2519

Comments:

The "CPEM" program will run either a V-20 or an 8088. The software automatically detects which processor is in the computer it is running on and adjusts itself for either hardware or software-only emulation. In the software-only mode, "CPEM" emulates a Z-80 CPU. When running a V-20, you have the option of running in the fast 8080-only emulation mode or you can switch back to a (slower) software Z-80 mode by typing "SET Z80."

The modem file transfer utility provided with "CPEM" is the least sophisticated method of transferring files of any that were provided with the different packages. Several times, I had intermittent problems when running "CPEM" with different programs. Some ran fine, other crashed with no warning. The ICU Group acknowledged the problems and sent me an updated version which they claimed solved the problems. But the update still crashed often in the Z-80 mode. "CPEM" has a lot of potential of being an excellent program, but the ICU Group will have to fix some of its bugs before it can reach its full potential.

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X-10 Peripheral
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sonal safety and convenience, and energy-savings -- it's now suitable for automating many types of production processes." **X-10**, formerly BSR X-10, is the world's leading maker of home control systems.

The peripheral is currently available for Apple IIc/IIe and Commodore 64/128 computers.

Mr. Lesser also explained the benefits of using **X-10 Powerhouse** around the home. "It serves many useful roles. As a security system, it outwits burglars by making a home look and sound lived-in. It's also an 'electronic servant' that awakens you weekday mornings to stereo music, brightened hallways, and fresh coffee, while remembering to let you sleep-in on Saturday. It turns on outside lights at dusk and off at dawn, and it switches off the TV and table lamp after you've fallen asleep. As an energy saver, it efficiently controls water heaters and central heating and air conditioning."

PC users will find **Powerhouse** software similar in use to popular spreadsheet software. Setting-up the control system is fast and easy, and changes can be made at any time. The software permits 24-hour, 7-day programming, so that day-to-day schedules can be, but need not be, different. (This feature is useful in security, energy-saving, and production applications.) The software tells the user how to select the lights, TVs, stereos, air conditioning and heating systems, and any other electrical devices to be controlled. The brightness of any incandescent light can be set to a selected level.

In addition to sending programming information into the controller, the software also permits instantaneous remote control of lamps and appliances directly from the computer keyboard.

As the user selects devices and timing schedules, the computer loads the information into **Powerhouse's** memory, and **Powerhouse** runs the entire control system according to the stored information. A 9V battery protects the controller's electronic memory and powers its self-contained clock, either during a power outage or when someone unplugs the unit to move it to another location.

The **Powerhouse** controller, which plugs into a typical electrical outlet, works by sending signals over the regular home AC wiring to **X-10** remote control modules anywhere in the home. Like earlier **X-10** home control products, the system requires no additional wiring and is quickly installed by homeowners or renters. Lamps and appliances, plugged into control modules (which in turn are plugged into wall outlets), are controlled by **Powerhouse** signals. As an added convenience, the **Powerhouse** console has rocker switches which provide instant manual ON-OFF control of eight lights or appliances.

In addition to plug-in modules, **X-10** makes wall switches and outlets that can replace normal home fixtures. These **X-10** products look and work like ordinary fixtures, and also respond to **Powerhouse** commands. **X-10** modules and accessories are readily available from Sears, Roebuck and Radio Shack. All **X-10** products are W.L. listed.

X-10 (USA) Inc. markets a complete line of home control products. Compatible products are private-labeled for Radio Shack under the trademark "Plug 'n Power," and are also availabe in Sears, Roebuck stores as the "Sears Home Control System." Another range of **X-10** products is marketed by Leviton Manufacturing Company to electrical distributors and contractors for commercial and industrial control applications, especially in energy management, and to the residential construction market for professionally installed home control systems. **X-10** products, designed for 220 Volt, 50 Hz operation, are marketed in Europe for commercial and consumer applications by Busch-Jaeger Elektro GmbH, a subsidiary of Brown Boveri.

Further information can be obtained from: X-10 (USA), Inc., 185A LeGrand Avenue, Northvale, NJ 07647. Phone 1-800-526-0027.

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* Over 85% of this ad has been printed using a PCFX, LePrint software and a Citizen MSP-10 printer (copy was reduced slightly)

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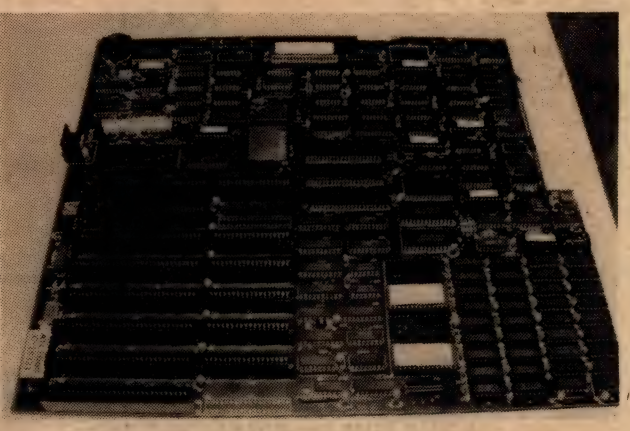

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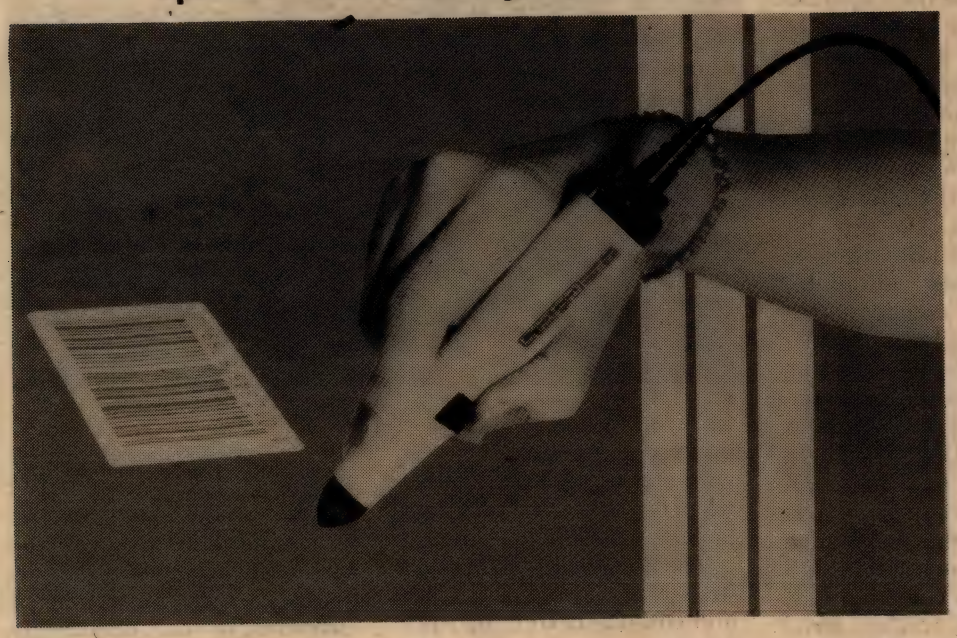

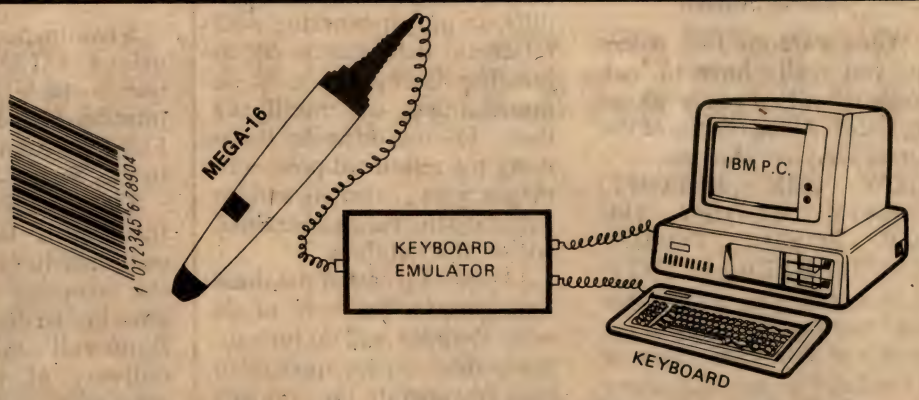

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Database a la Lotus

continued from page 54

be in drive A: when I first boot up. Inconvenient but safe...

Getting Started

When Paradox first comes up, you really have to look closely to see that you're not using Lotus. Along the top of the screen are your choices: VIEW, ASK, REPORT, CREATE, MODIFY, IMAGE, FORMS, TOOLS, SCRIPTS, HELP and EXIT. As in Lotus, you may either enter the first character of the command (like C to create or H for help) or you may move the highlight from command to command (using the cursor key) and run it by pressing return.

The View Menu

The View option permits you to load an existing database and view it on the screen. Once in view, you may then opt to perform additional tasks such as sorting, listing or printing.

Paradox allows you to view more than one database, also referred to as tables, simultaneously on the screen. There are commands that allow you to scroll from left to right (for those tables extending beyond the end of the screen), and move tables up and down (when viewing multiple tables on the screen).

The Ask Menu

Ansa is most proud of this section, for it is this section that sets Paradox apart from the rest. To begin with, the most difficult part in working with relational databases is not in creating them, nor is it in maintaining or modifying them. The real difficulty lies in using the relational powers to obtain, view, calculate and extrapolate the values contained within the database.

I know of no other database that permits the user to do what Paradox will do interactively; most require application code to generate the complex set of instruction often needed to work with data on this level.

Ansa solved the complexity, in part, by implementing artificial intelligence into the program. While this is transparent to the end user, it is this feature that makes Paradox so powerful yet so easy to use.

To perform most relational searches, you merely check which fields you want displayed after the search and specify conditions for one or more of the fields. Ansa will automatically create another table on the screen containing only those records from the main database meeting all of the criteria you specified in each of the fields.

continued on page 92

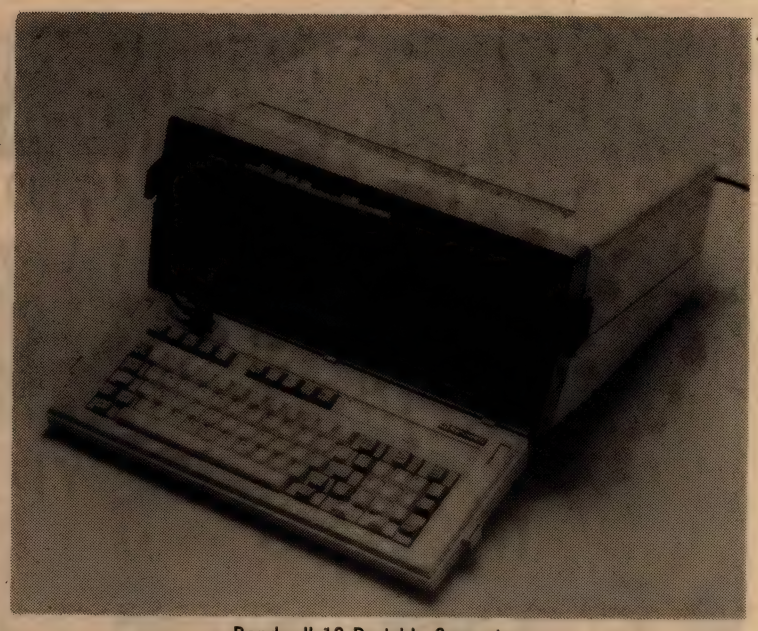
Bondwell Introduces IBM-Compatible Transportable Computer

A feature packed, affordably priced IBM-Compatible transportable computer was introduced by Bondwell at the Fall 1985 Comdex trade show in Las Vegas, Nevada.

The new "Bondwell 18" is the fourth IBM-compatible computer to be introduced by the company in the last six months. In September 1985, Bondwell made its first delivery of desktop IBM-compatible personal computers to dealers, the Bondwell 32/34/36 Series.

The 28-pound Bondwell 18 is an integrated "affordable transportable" computer that can run all the most popular IBM-compatible software -- including Lotus 1-2-3, Symphony, Sidekick, WordStar 2000, Dbase III, and Flight Simulator. It features 512K RAM, dual 5¼-inch DS/DD floppy disk drives, 9-inch monochrome monitor, RGB and composite color outputs, real time clock, RS232C serial and centronics parallel ports.

The machine also comes complete with MS-DOS system software and GW BASIC programming language. According to Bondwell Vice President, the new Bondwell 18 will be very competitively priced with cost of under $2,000.00, when it is available for delivery in January 1986.



Bondwell 18 Portable Computer

The Bondwell 18 follows our strategy of only offering dealers and consumers true high performance value products. We believe that, the BW-18 computer will deliver a price performance value that's hard to match anywhere in the market today.

Coupled with the recent delivery of the three Bondwell brand IBM-compatible desktop models, Bondwell's vice president believes the company now offers an extremely competitive line of products to an increasingly price-sensitive market.

For further information contact Bondwell, 3300 Seldon Court #10, Fremont, CA 94539, (415)490-4300.

Mention that you read about it in *Computer Shopper*. ●

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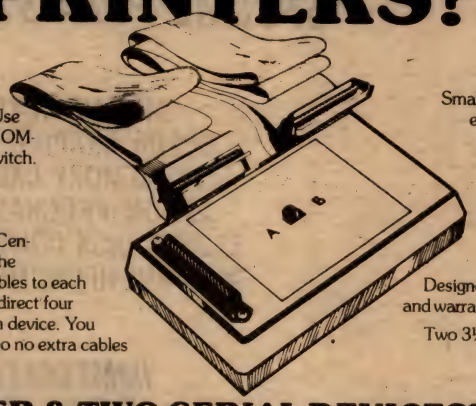

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To install, connect any standard Centronics Parallel Cable directly to the switch and connect the switch cables to each printer. The Printer Switch will redirect four signal connections to your chosen device. You can even use your existing cable so no extra cables may be required.

Compact Design, Quality Construction.
Small (5¾" x 3⅝" x 1⅛") heavy duty enclosure fits any workstation or even wall mounts. This switch is U.L. Approved and thoroughly tested by the manufacturer.

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Designed to operate faithfully for years and warranted against defects for one year.

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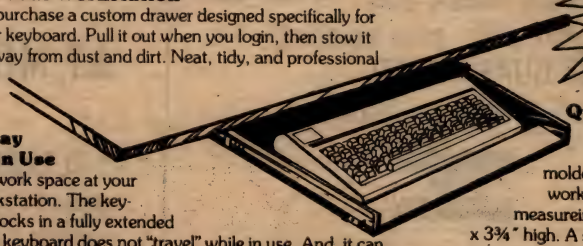

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Free valuable work space at your computer workstation. The keyboard drawer locks in a fully extended position to the keyboard does not "travel" while in use. And, it can be adjusted to three heights for different users. Once you're done, simply slide it away and out of sight.

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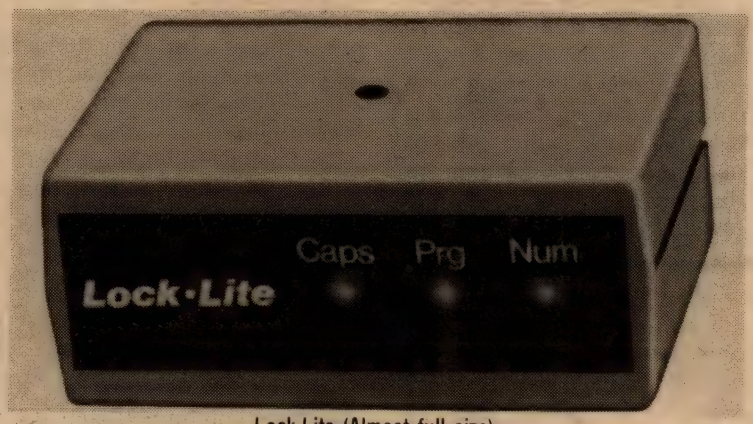
New Lock-Lite Makes IBM PC And XT Keyboards Failsafe!

Lock-Lite, from Lambert Logical Design, is a device which uses lights and sound to end frustrating errors on the IBM PC keyboard. This unique, matchbox-size accessory tells the state of CAPS LOCK and NUM LOCK with red and green lights. It also beeps whenever a LOCK key is hit, even if by accident, warning the user that the keyboard state has changed.

Lock-Lite's beep also sounds to warn the user of many other PC/XT keyboard trouble spots, such as missing the shift key, accidentally getting lowercase by shifting while in CAPS LOCK, or missing the return key. These features are a great help to word processing or other keyboard intensive applications.

Lock-Lite instantly clarifies confusing aspects of the keyboard, allowing newcomers to the PC to learn the computer with more speed and less effort. For all users, concentration and productivity are increased because the need to stop and think about the keyboard intensive applications.



Lock-Lite (Almost full size)

Lock-Lite instantly clarifies confusing aspects of the keyboard, allowing newcomers to the PC to learn the computer with more speed and less effort. For all users, concentration and productivity are increased because the need to stop and think about the keyboard is eliminated.

In addition, Lock-Lite has an amber light and beep that can be easily programmed to signal the use of any key on the keyboard, even Control or Alt-plus-key combinations. PC users no longer have to worry about Control-PrintScreen, accidentally hitting the Insert key, or any software-specific toggle key. Lock-Lite immediately and continuously alerts the user with light and sound to any specified keyboard event.

Many IBM PC users do not know that the shift keys switch the CAPS and NUM LOCK states of the keyboard to their opposite states. Lock-Lite watches the shift keys and changes its CAPS and NUM indicators to show the correct keyboard state at all times. This feature helps spreadsheet users switch quickly between the arrow/number functions of the keypad by simply using the shift key, never needing to touch NUM LOCK. Users entering text are made aware that they are shifting into lowercase when CAPS LOCK is engaged.

Lock-Lite is exceptionally easy to install. Merely plug the keyboard into Lock-Lite's cable, plug the other end of the cable into the computer, put the lights where they are most visible, and that's it. Installing Lock-Lite gives the extra bonus of a four-foot extension to the keyboard cable, greatly increasing operator mobility.

Since it is completely external, Lock-Lite requires no software and will never interfere with any software the computer runs.

For further information contact Lock-Lite, Dept. C-8, 513 Wilshire Blvd., Suite #228, Santa Monica, CA 90401.

Mention that you read about it in *Computer Shopper*. ●

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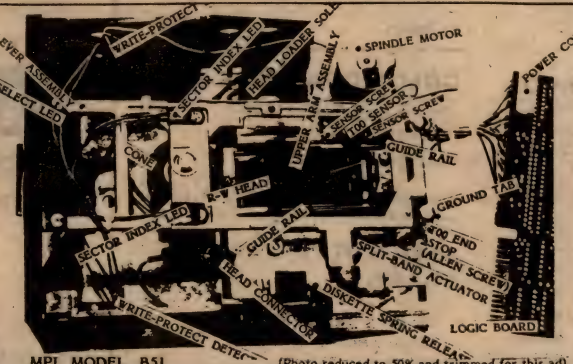

MPI MODEL B51 (Photo reduced to 50% and trimmed for this ad)

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Designs, operation, installation and uses completely described and illustrated - circuit diagrams, voltages, currents, frequencies and waveforms. How these devices result in healing success rates of 80% to 90%!. These devices are leased by commercial manufacturers to physicians for $2,000 each per application. You can build them for about $50 each!

Includes descriptions of CARDIAC PACEMAKERS, PHRENIC NERVE STIMULATORS, DEFIBRILLATORS, PAIN KILLERS, SIGHT & HEARING RESTORERS, BODY FUNCTIONS CONTROLLERS, and TISSUE REGENERATORS; detailed description of osteogenesis; how electromagnetic healing works. Extra sections on: (A) Natural body electricity. (B) Wound healing. (C) MEG devices. (D) Magnetic Necklace. (E) Orthodontical devices. (F) Mind control and automatic learning. ONLY $9.

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COMPUTER PHREAKING ☐
PRINTER & PLOTTER MANUAL ☐

Database a la Lotus

continued from page 90

Report

This is probably the section most dBase fans turn to first. Since dBase has been around, non-programmers have long cried the blues when it comes to report generation. Paradox has made it much simpler.

To start off, Paradox offers two different methods for producing reports: tabular and free-form. The tabular report form is much like the format viewed on the screen; data is arranged and printed in columns.

The tabular output of printed reports enables you to easily format numeric output, specify the date structure from mm/dd/yy to month dd/yy and allows you to specify what columns are totaled, etc. By declaring certain groups of data, you can easily obtain sub-totals. This type of report is by far the most commonly produced.

The free-form method is an extremely versatile ability to have for a database output form; it makes working with continuous form business stationary much easier. As its name implies, free-form means that you may locate data and text anywhere on the form. As a matter of fact, using this method of report generation you can easily create form letters without ever using your word processor!

Setting up your free-form output takes a little navigation across the screen. Don't be surprised if this is the only place you might have to actually refer back to the manual, but it is still much easier than dBase. The final reports generated by the Report Generator are easy and extremely flexible.

Creating the Database

When you create a database, you immediately get a feel for the ease with Paradox interfaces with the operator. Once you tell Paradox the name of the file you wish to create, a menu appears on the screen which prompts you to enter the information concerning the individual fields contained in each record.

Each field is assigned a name, a type (alphanumeric, numbers, dollar amounts or a date) and may be flagged if it is part of a key field that must be indexed. These key fields (and there may be more than one), create an index based on the field which permits you to locate information within the database much faster. Also, the information is displayed in sorted order based on the key field used.

Image

The Image option is used when you want to take an existing database and rearrange the order in which the various fields are displayed on the screen. Unless you do otherwise, the changes made using this option are only temporary.

Using this utility, you may change the table and column size, modify the format used to represent numbers and dates and to rearrange the order of the fields.

Forms

Paradox offers the user a simple way to create custom screen formats which may then be used to enter or display individual records of information. One uncelebrated feature of this is that if you specify certain fields to be displayed from your database, and if you rename those field in the original database, Paradox will automatically update your form to show the same field.

Each form consists of a single screen configured whatever way you desire. Along with the actual text and borders, special codes are used to indicate where to place the individual fields of data on the screen. It is especially nice to create forms for data entry modes. This mode should not be confused by the Reports section, as a form is only used to view/enter one record at a time.

Tools

Paradox contains the standard set of utilities found in any database program, but a few of them are worth noting. First of all, Paradox has two

continued on page 95

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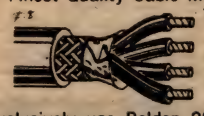

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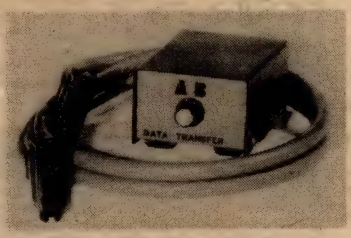

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Cordata (Corona Data Systems) AT-Compatible Computers

Comdex/Fall '85 - Corona Data Systems, Inc. announced the Corona ATD desktop family of computers to complement the company's ATP transportable PCs.

The Corona ATD, which is compatible with the IBM® PC AT, is being demonstrated here for the first time at the COMDEX/Fall '85 computer industry trade show, Nov. 20-24. Demonstrations took place in the company's booth, #4116, in the North Hall of the Las Vegas Convention Center.

The ATD computers are based on the Intel 80286-8 microprocessor and feature a clock rate of 8 megahertz with no wait states.

Because the processor operates with no wait states, the ATD is faster than competing models. In fact, when tested under the Norton Utilities System Information Program our ATDs, and our ATPs, run over 60 percent faster than the IBM PC AT and approximately 20 percent faster than Compaq Computer's AT compatibles.

The speed of the Corona AT compatibles makes them ideal for large power users. Scientists, engineers, users of large, complicated spreadsheets and others who perform numbers-intensive work are our target markets.

The Norton Utilities System Information Program, developed by Peter Norton, is a benchmark program for personal computers that tests processor functions. It uses the IBM PC XT as a reference, with a figure of merit of 1. Against that rating, the IBM PC AT received a 5.7 rating; Compaq Computer's AT compatibles received a 7.9; and the Corona ATP received a 9.1 in the benchmark tests.

Three models of the ATD are available, each with 640K of memory on the main system board. The ATD-8-Q includes 1.2 megabytes of floppy disk storage. The ATD-8-Q20 includes a 1.2 megabyte floppy disk drive, a 20-megabyte hard disk and an AT-compatible hard disk controller. The ATD-8-QT40 includes a 1.2-megabyte floppy, a 40-megabyte hard disk drive and controller, and a 60-megabyte streaming tape drive for backup.

Bundled with the MS-DOS™ 3.1 multiuser operating system and GW BASIC™ 3.1 programming language, the ATDs can be used in a standalone mode or can be

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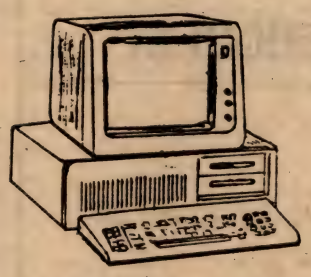
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Database a la Lotus
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utilities designed to safeguard your data. The first, called Protect, permits you to set the files read/write status to read only. This DOS capability prevents anyone from accidentally erasing or overwriting a database.

One of dBaseIII's real shortcomings is the inability to provide password protection to its databases. Paradox furnishes the user with built in procedures for providing complete password protection/data encryption all of its database it creates. Passwords may contain up to 50 characters (including spaces).

When password protection is added to a Paradox database, the actual data files are encrypted in such a way that you cannot type the data out manually and see it. Also, when you attempt to work on a protected database, Paradox will prompt you for the password automatically; it will not let you work on the file until the correct password is entered.

Despite the growing number of integrated packages hitting the market today, the vast majority of microcomputers are running single purpose programs. Information exchange between these programs is often a problem. Paradox's answer to this predicament was to provide built in import and export routines that are able to work directly with the other programs native data format. Paradox has the ability to either read from or create data files for Lotus 123, Symphony, dBaseII, dBaseIII, Pfs and VisiCalc. Of course Paradox also supports ASCII data formats with different separators.

Using this feature, I was able to import a database created under dBaseIII, modify the data and send it right back into the original dBase file! This capability is certainly my favorite.

Finally, one additional tool offered by Paradox worth mentioning is the feature they called QuerySpeedup. This command enables you to create a temporary index on one of the fields contained in the database as an aid to searching the data. The index can later be removed after you are done working with the file.

Scripts

In much the same fashion as Lotus, Paradox offers the user the ability to create scripts. These scripts, or macros as they are called in Lotus, enable the user to record a sequence of keystrokes for later playback. If you routinely perform tasks, these can be recorded so that you only press a few keys to call up the script which will, in turn, perform one or more tasks.

Paradox contains its own editor for creating these macros. Also, thru scripts the user is able to tap into the
continued on page 98

Cordata Data
continued from page 94

hooked to a local area network.

The ATD's main board also includes a built-in floppy disk drive controller, parallel and serial ports, and a socket for an 80287 floating point math co-processor.

The ATDs feature a 14-inch, green phosphor tilt and swivel screen with 640 x 400-line high resolution graphics, twice the resolution of most industry-standard PCs. They can also operate in an enhanced 640 x 220-line emulation mode. Text resolution is extremely high due to the use of fully formed 16 x 13 dot matrix characters in a 16 x 16 matrix cell.

A color/monochrome video graphics card, included in the base price of the ATDs, allows users to convert them into color systems by attaching a color monitor to a jack in the back of the machine.

Six expansion slots are housed in the ATDs, four of which are AT-compatible and two, PC-compatible. The ATDs also include a realtime clock calendar, 130W switch selectable power supply and an IBM AT-compatible detachable keyboard.

ATD shipments will begin in the first quarter of 1986. List prices are: $3,995 for the ATD-8-Q; $5,495, for the ATD-8-Q20; and $8,995 for the ATD-8-QT40.

Corona Data Systems (which will change its name to Cordata, Inc. beginning in January 1986), designs, manufactures and markets high-quality, high-performance, industry-standard microcomputers and peripherals to meet the needs of professionals and small to mid-sized companies. The company is headquartered in Thousand Oaks, Calif.

For further information contact Corona Data Systems, Inc., 275 East Hillcrest Drive, Thousand Oaks, CA 91360. (805) 495-5800.

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Atari 520, Amiga, IBM PC Kaypro, Osborne, RS, Sanyo	Cable	$209	$289	$399	$285/$375	$269/$359	$255
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PC\FLIST

continued from page 54

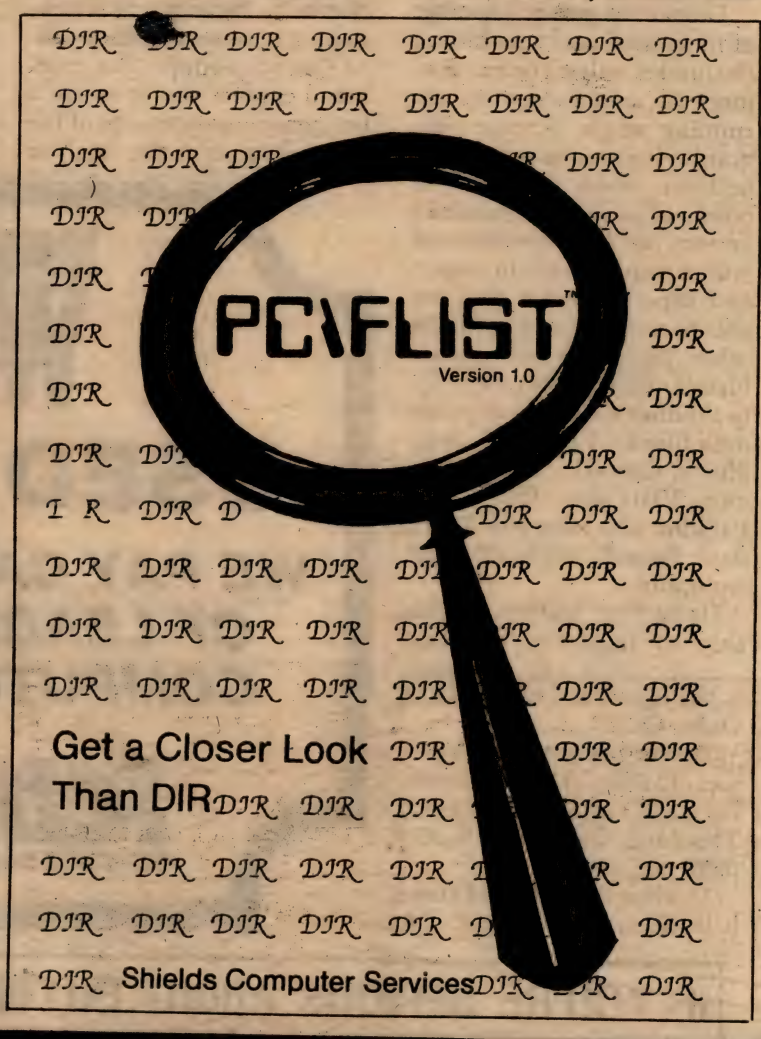
You can redefine the function keys easily to suit your needs by using the FKEY command. (The program manual warns against assigning ERASE or DEL commands to a function key. A careless keystroke could cause you to erase a file accidentally — when you meant just to COPY it.) Function keys also can be redefined *temporarily*, so you can use them for special purposes. When you exit from PC\FLIST the function key definitions revert to their normal default settings.

If you want to leave the FL list of files without actually exiting PC\FLIST — and losing temporary function key definitions — simply type CTRL/D. This takes you to a special screen where you can enter DOS commands with any parameters, or even execute another program. For example, you can look at another directory (type FL A: and <return>), check the status of another disk (CHKDSK A: and <return>), or even run a program in another drive (D:BASIC). It's almost like having a "window" in PC\FLIST.

PC\FLIST also sorts files by name, extension, date and time, or size of files, so you can arrange an FL directory to suit your needs.

BROWSE is a small part of the package, yet one of the more interesting parts in some ways. It takes up just over 8K, but does the same thing as the MS-DOS TYPE command — with a little DEBUG thrown in — by letting you view *both* ASCII and Hex files! It displays files one screen at a time (press F8 for next screen) and pro-

continued on page 100



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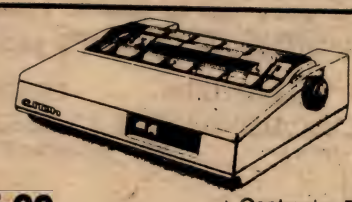

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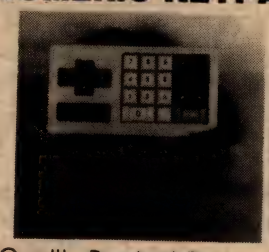

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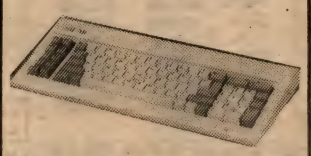

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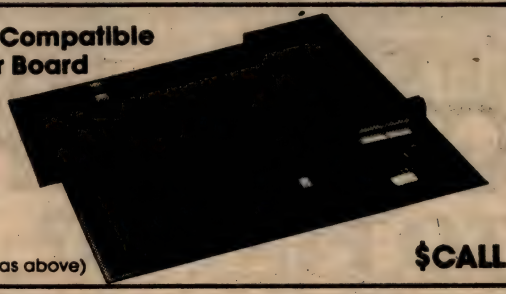

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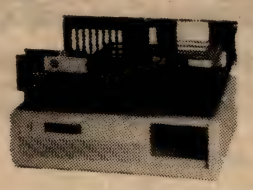

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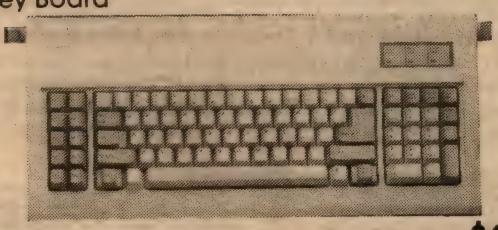

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Typ-Set Lettering Software Outputs Fonts On Printers

Enter Computer, Inc., San Diego-based manufacturer of Sweet-P plotters, recently introduced Release 2.0 of its **TYP-SET** lettering software package. This latest version of **TYP-SET**, still priced at $299 per package with six fonts and available immediately, enables users of IBM PC and compatible microcomputers to output letters, numbers and punctuation marks by using any number of popular printers. Previously, **TYP-SET** Release 1.0 could output on paper, acetate or self-adhesive labels only through use of a plotter. The PC user can now also operate **TYP-SET** to create 35mm slides when connected to a video image recorder such as the Polaroid Palette. Colors can now be addressed on the personal computer screen with the addition of an IBM or compatible color graphics card.

The company also announced that **TYP-SET** Release 2.0's library of fonts now include characters for all Western European languages and that these and a wide variety of English-language fonts are available to original equipment manufacturers (OEMs), system integrators and value-added resellers for inclusion in their custom software or firmware, "at a very competitive price," according to **Enter Computer.**

TYP-SET Release 2.0 also includes an icon library, consisting of many common shapes such as circles, hand with finger pointing, etc., "with which a PC user can create a

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Database a la Lotus

continued from page 95

Paradox Programming Language (PAL), a language designed to create complete database management systems.

How fast Is It?

I thought that a small benchmark might reveal something about the capabilities of Paradox, so I decided to create a large list and then sort it. For the test, I wrote a Turbo Pascal program that generated 5,000 records consisting of a randomly generated last name, first name and middle initial. These ASCII format strings were separated with commas, a format chosen since both programs could read the exact same file. The actual data file created for the benchmark consisted of 225,000 bytes.

For the actual sort, two of the three fields were used as sorting keys, the first name and then the last name. This is the reverse order that they were entered into the actual ASCII file, further complicating the sorting routine. The results surprised even myself:

PROGRAM	TIME TO LOAD FILE	TIME TO SORT FILE
dBASE	242 SECONDS	337 SECONDS
PARADOX	193 SECONDS	118 SECONDS
CHANGE	1.25	2.86

Loading the ASCII files and translating them into each programs native format demonstrated Paradox's speed advantage over dBase of 25%. Sorting the files was even more dramatic - Paradox was 2.86 times faster than dBase. Much of this is probably attributable to the memory management performed by Paradox vs. disk management. No matter what the reason, when the data becomes large, Paradox's advantage over dBase substantially increases.

Conclusion

Ansa has created nothing short of a masterpiece. Paradox is easy to learn, easy to use, and as powerful as any microcomputer based relational database manager currently produced.

The Lotus interface used by Paradox and the macro capabilities will further endear Paradox into corporate America. Paradox will permit the non-programmer to utilize all of the features relational databases have to offer without a summer off for classes.

For applications that do necessitate actual programming, the Paradox Application Language (or PAL, for short), is as rich in commands as is dBase III.

I have only one complaint against Paradox - it is copy protected. Once Quaid Software (makers of Copywrit) or Software Point (makers of CopyIIPC) find a way around that, the program will loose my only dissatisfaction. Better that Ansa should eliminate the copy protection on their own, but don't count on it.

Is the dBase reign finally over??? ●

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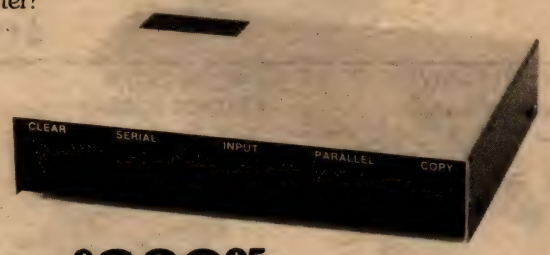

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New Digicom Multi-Channel PC Board Announced

DigiBoard, Inc., has announced a new edition of DIGICOM advanced multi-channel communications boards for the Personal Computer. The new DIGICOM edition is one of a series of multi-user products now being developed by DigiBoard, a recent spinoff of Digigraphic Systems Corp.

DIGICOM, producted with four or eight asynchronous ports, is a highly versatile multi-channel board for use with the IBM PC, XT, PC/AT and most compatibles, as well as most popular multi-user operating systems including Xenix, PICK, THEOS, QNX, MBOS/5, and Multi-Link as well as other Unix and non-Unix based systems.

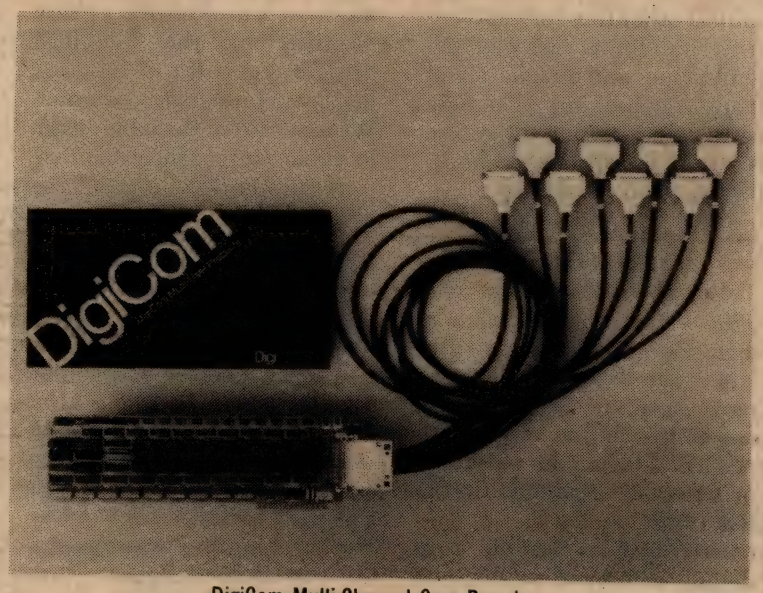
DIGICOM will enhance computer speed by controlling I/O interrupts with special board-level firmware. This advanced design permits only one interrupt request at a time, and handles additional requests in sequential order.

The new DIGICOM product will also assure maximum flexibility for system users, within IBM specifications, with dedicated 8250 UARTs which can be set to any Baud rate and any address. DIGICOM/8, which features eight asynchronous ports, and DIGICOM/4, with four ports, can be linked to provide up to 32 ports for users.

DIGICOM/8 has a list price of $649 and DIGICOM/4 is priced at $429 with discounts available to dealers and volume purchasers. The price includes all cabling as well as software drivers for Xenix and MS-DOS.

DigiBoard President John Schinas said the new DIGICOM products are the first in a series of leading-edge PC multi-user products for the OEM and VAR/VAD market which will be designed and manufactured by the new company.

Schinas also introduced a totally new team support concept for the OEM and VAR/VAD market served by DigiBoard called, "Digi-Team," to provide accessible technical service and support to customers.



DigiCom Multi-Channel Com Board

"We are in a sophisticated and highly technical market where service and support are as important as the product itself. We plan on being the best at providing all three — service, support and product," Schinas said. The company has established a toll-free number (800) DIGIBRD, for quick and convenient access by customers with problems.

DigiBoard was formed by an employee group from Digigraphic Systems Corp. earlier this year, headed by Schinas, which acquired the EXTEND product line. The line includes the DIGICOM series, which will head DigiBoard's new product line of multi-user PC products, encompassing versatile multi-user board products and multi-user oriented software and hardware peripherals.

For further information contact DigiBoard, 6751 Oxford Street, St. Louis Park, MN 55426. (612) 922-8055.

Mention that you read about it in *Computer Shopper*. ●

MasterForth Supports An 8087 Assembler And Hardware F/P Package

MicroMotion MasterForth 1.2 for the IBM PC family now supports the 8087/80287 math co-processors. This 8087 extension includes a complete macro assembler with local labels supporting all precisions, opcodes, and synchronization. The floating-point package includes a full complement of transcendental and high-level functions, as well as formatted input and output routines. Both the assembler and the floating-point package are provided as source files and as relocatable overlays. A software version of this package, which completely matches the hardware version, is also available. Applications can test for the presence of the 8087 co-processor and select the appropriate overlay.

MiroMotion MasterForth 1.2 runs on all members of the IBM family and includes a full file interface to MS DOS 2.1-3.1. It is also available for the Macintosh, the Apple family, the Commodore 64 and CP/M. Software can be written on one system and run on all the others. MasterForth retails for $125.00 Several additional extensions are available.

For additional information contact MicroMotion, 8726 Sepulveda Bl. #A171, Los Angeles, CA 90045, (213) 821-4340.

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ANSA's Paradox
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formatted dollar ($) and date types. The "Memo" and "Logical" types found in dBase III do not exist in Paradox. In defining the file, the user must specify the maximum size for alphanumeric fields; the size definition is not required for the other types of fields. For the purposes of this review, we set up four tables: 1. Inventory File--containing Part#, Quantity & Price; 2. Parts Master File--Part# Description, Supplier & Supplier#; 3. Open Order file--Customer#, Part#, Quantity & Date Ordered; 4. Customer Master Field-Customer# & Name. The setup of these files required little effort and was quite similar to setting up files in dBase. Once set up, the files may be restructured by the use of the "RESTRUCTURE" command (within the "MODIFY" menu). If data has already been entered into the file to be restructured, the data will be brought over to the re structured file.

To enter data into the defined files, we choose the "DATA-ENTRY" command from the "MODIFY" menu. This command allows entry of data in batch mode with the actual file updating accomplished at the conclusion of the inputting process (when the "DoIt!" key is pressed). When the user enters this mode, the Table format for entry is presented in the spreadsheet-like environment described above. If the user desires the more traditional "single form for each record" type of input, the F7 "FORM TOGGLE" key is pressed and a predefined (using the "DESIGN" command in the "FORMS" menu) custom form is presented. (If a form had not previously been defined, the system will automatically create a form with one field per line in the order of the file structure. This form may be modified later using the "CHANGE" command in the "FORMS" menu.) The form utilized for inputting may contain input validation criteria (defined using the "VAL-CHECK" selection from either the "EDIT" or "DATA-ENTRY" menus) that includes range checking, table lookup against other files for valid entries, automatic entry of default values and designation of fields as mandatory. The data entry process within the system is easy to use and has no built-in delays due to overhead.

Once the data has been entered, we may examine the tables by selecting "VIEW" from the Main Menu and specifying the name of the table we wish to look at. (If we do not know which table or simply don't wish to type the complete name, we simply press "Return" at the "Table:" prompt and a list of tables is displayed for cursor selection.) We may look at the table either in table (spreadsheet-like) or form format (by the use of the "FORM TOGGLE" key). If form format is selected, we may move through the file by use of the "Pg Up" and "Pg Dn" keys. In either format, editing may be accomplished by entering edit mode through depression of the F9--"EDIT" key.

Paradox really begins to shine when we interrogate the files. We select the "ASK" choice from the Main Menu and are then prompted for the

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PC\FLIST
continued from page 96

vides a variety of commands, including up, down, right and left cursor keys, that let you move around in files quickly and easily. You can even search ASCII and Hex files for words or strings of characters using BROWSE.

BROWSE is set up as a default command (which you can change) for the F2 function key, so you don't even have to type in the command to invoke it. Colors of the cursor, heading, function keys and Help screen in the BROWSE mode can be changed by using the BKEY command.

PC\FLIST is useful for any computer configuration, but it's especially valuable with a hard disk system. It greatly simplifies dealing with directories and subdirectories. The program includes a few tricks for searching and reporting size of subdirectories that cure some MS-DOS deficiencies.

One irritating thing about the DOS DIR command is that it always lists the size of subdirectories as 0. In PC\FLIST, when you press CTRL/Z the screen is cleared and then a list of all subdirectories in the current search list is displayed. Next, you're returned to the prior menu with the sum of the size of all files in each subdirectory listed. Nested subdirectories are also searched and counted. Those of you out there with hard disks stuffed with lots of files divided and redivided into a maze of subdirectories will certainly find this feature a major plus!

Then there are the CTRL/Q and CTRL/W modes. Just type CTRL/Q next to the subdirectory name to add it to your current search string. Press CTRL/W and you back up one level in the search string. If you were searching the subdirectory C:/AAA/BBB/*.*, for example, and typed CTRL/W, you would switch the search to C:/AAA/*.*. Pressing CRTL/W yet again would take you back to the root directory, C:/*.*.

These two functions help you move around a disk's subdirectories with ease.

The 20-page manual, written by Kendra R. Bonnett, included with PC\FLIST is well done, with lots of examples of screen displays to illustrate what is covered in the text. A real plus in my book, since the opinion here is that manuals can't have too many illustrations.

I've found the best way to use PC\FLIST is to create an FLIST subdirectory and edit the AUTOEXEC.BAT file so an FL display of the root directory appears automatically when I boot up the system. From there it's easy to check other directories, execute application programs or whatever — and it saves time, too.

The program isn't copy-protected, so you'll have no trouble making backup copies or installing it on a hard disk.

In short, PC\FLIST isn't an earth-shaking program that will revolutionize computing, but it offers a lot for very little cost. After using it for a while you wonder how you ever got along without it. If you can't find it locally, write to Shields Computer Services, 9 Yarrow Lane, Novato, CA 94947 for information. ●

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ANSA's Paradox
continued from page 100

table we wish to query. When we respond with the table selection, we are presented with a blank table form that serves as an input form for the query. We move the cursor from field to field and indicate whether the field is to be included in the output, whether or not selection criteria is to be used for the field and other query commands that we will explore shortly. When the query has been defined, the "DO_IT!" key is depressed, the query is executed and the results are stored in a new table called "Answer."

Sound confusing? It's really not and once it has been done more than a few times it becomes second nature. As an example, to select all inventory items that have a unit price of more than $5.00, we, after seeing the query form, move the cursor to each field that we wish included in the "Answer" table (in this case, "Part#," "Quantity" & "Price"--all the fields) and enter a check mark by depressing the F6 "CHECK MARK" key. When we reach the "Price" field, we also enter "> 5.00" to perform the selection. We then press the "DO_IT" key, the query is performed and the "Answer" table appears on the screen (the "Answer" table may now be queried as any other table might be).

The power of the query function described so far may seem impressive but you ain't seen nothing yet! Now lets expand the query to bring in other tables--to operate in a RELATIONAL mode. Now we see the "Query By Example" method mentioned earlier. Let's say we need to also see the Description of those parts that were priced over $5.00 in our earlier query. We repeat the original query but in the "Part#" field, in addition to the check mark, we enter an example. To do this, we depress F5--"EXAMPLE" key and enter any word such as "WOW." We then, without pressing "DO_IT!," get the Main Menu by pressing the "MENU" key, select "ASK" and select the Parts Master File. We then place a check mark in the "Description" field and in the "Part#" field, depress the "EXAMPLE" key and enter the same word, "WOW" that was used above in the "Part#" field of the Inventory file. What we have told Paradox by this example is that when the same characters are in the "Part#" fields of both files, the Description for the part is to go into the "Answer" table with the "Part#," "Quantity" and "Price." We have given the system an example ("JONES" = "JONES") and when we now press "DOIT," the query is processed and a new "Answer" table is generated containing "Part#," "Quantity," "Price" and "Description" for all items that are priced over $5.00.

The power of the query portion of Paradox goes beyond the interrogation function. We can automatically insert, delete, change and find records through the "ASK" menu selection. The change function is especially interesting. If we wished to increase the price of all items priced over $5.00 by 7.25%, we would merely go to the "Price" field, enter "> 5.00" and then using the "EXAMPLE" key, enter "price, changeto price * 1.0725" and press the "DOIT!" key (Note: "changeto" is a Paradox command and not a typographical error). Paradox will both produce a new Inventory file containing changed prices for those items over $5.00 and a "Changed" file containing the original records (the "Changed" file will be overwritten the next time a "CHANGETO" query is executed and will be deleted when Paradox is exited).

The power of Paradox expands geometrically when one saves (through the use of "QUERYSAVE" in the "SCRIPTS" menu) the query successfully into a "script" that may be recalled by name and run at any time. This ability to record queries is actually the basis of the very powerful programming capability in Paradox. In addition to the recording of queries, we can (through the use of "BEGINRECORD" in the "SCRIPTS" menu) record any sequence of commands and keystrokes into a script. We can then (through the use of "EDITOR" in the "SCRIPTS" menu), enter the Paradox Editor and modify the script, enhance it through the use of "PAL" ("Paradox Applications Language"), the system's programming, language and, perhaps, add a query from another script. Using Paradox as a development tool in this manner, we have implemented applications for our clients in a fraction of the time that would have been required under dBase III. We will return to the programming language shortly; suffice it to say at this point that it is certainly as powerful as any of the competitive data base languages. The more important point for applications developers is the reduction in the development time that results from the automatic form generation, ease in development of relational queries, recording of queries, commands and keystrokes for editing and future "PLAY"ing (the equivalent of "DO" in dBASE). The impact of these features on development time

continued on page 104

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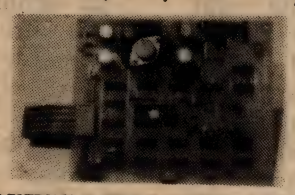

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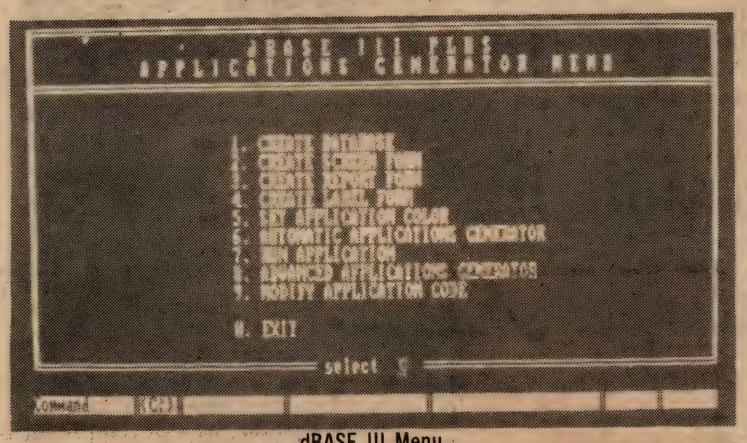
Aston-Tate Introduces dBASE III PLUS

Aston-Tate, developer and marketer of the industry-standard dBASE family of database management software, has now introduced dBASE III PLUS, a complete database management system that combines ease of use and power with built-in multi-user, as well as single-user, capability.

dBASE III PLUS, introduced at COMDEX/Fall '85, will succeed dBASE III, the industry's best-selling 16-bit microcomputer database management software (DBMS), according to Edward M. Esber, Jr., president and chief executive officer of the Torrence, California, company.

"With dBASE III PLUS, we are raising the existing database management standard of the microcomputer software industry," Esber said. "dBASE II and dBASE III set that standard and have more than 550,000 users worldwide. Our DBMS product family extends from single-user packages to multi-user solutions to address the needs of the entire spectrum of database users."



dBASE III Menu

dBASE III PLUS provides users with a natural growth path. It opens up day-to-day and sophisticated data management functions to a new generation of dBASE users without requiring them to learn a programming language. dBASE III PLUS also features increased programming capabilities and maintains the dot prompt interface of dBASE II and III.

"An important feature of dBASE III is its true multi-user capability - built into every package - which permits multiple users to access the same data files at the same time without data corruption," Esber said. "Businesses and organizations that plan to network groups of microcomputer users to share data can now do so with the industry-standard DBMS solution, backed by Ashton-Tate's quality service and support capability."

Each copy of dBASE III PLUS may be installed on a local area network (LAN) and support one initial user. All dBASE III programs and files may migrate to the LAN environment and full single-user dBASE III PLUS capabilities are available on the LAN.

dBASE III PLUS's multi-user capability includes file and record-locking features that provide true multi-user data access without data corruption, eight levels of password protection, and high-speed encryption and decryption of data.

Ashton-Tate offers several options to users who wish to network. Beginning with a copy of dBASE III PLUS, users may add multi-user capability by adding:

(1) Multiple copies of dBASE III PLUS, which can be used for both LAN and stand-alone use.

(2) dBASE III PLUS LAN Pack, also introduced by Ashton-Tate, which permits network-only access to deBASE III PLUS. Each LAN Pack, priced at $995, enables three additional users to join the dBASE III PLUS network at a per-user cost of less than $425.

(3) A combination of both dBASE III PLUS packages and dBASE III PLUS LAN Packs.

dBASE III PLUS is priced at $695 and will be available at Ashton-Tate authorized dealers in January 1986. Registered users of dBASE III, or those with proof of purchase, may upgrade to dBASE III PLUS for $99 during the first 90 days of the product's availabilty and for $140 thereafter. Those who purchased dBASE III after October 1, 1985, and all purchasers of the dBASE III Developer's Release, are entitled to a free upgrade. Unregistered users may call a toll-free number [1-800-437-4329] for upgrade information. Registered corporate dBASE III users are eligible for bulk purchase discounts on volume upgrades.

dBASE III PLUS has improved speed and performance, while maintaining dBASE III's capacity of one billion records per file and minimum stand-alone memory requirement of 256K bytes of random access memory (RAM). dBASE III PLUS sorts up to two times faster and indexes up to 10 times faster than dBASE III.

In its stand-alone mode, dBASE III PLUS runs on the IBM PC, PC XT, PC AT, or 100 percent compatible computers. In addition to 256K bytes of RAM, it requires a dual 5-1/4 inch 360K-byte floppy disk drive, or one fixed disk drive and one 360K-byte floppy disk drive, a monochrome monitor and PC-DOS 2.0 or higher. dBASE III PLUS supports color monitors and and printer with 80 or more columns, including laser prints.

In its network mode, dBASE III PLUS also runs on the IBM PC, PC XT, PC AT, or 100 percent compatible computers and supports monochrome or color monitors and printers with 80 or more columns. Server-workstations require a minimum of 640K bytes of RAM and one fixed disk drive with one 5-1/4 inch 360K-byte floppy disk drive. Workstations require 384K RAM and one 360K-byte floppy disk drive.

dBASE III PLUS operates on the IBM PC Network under PC-DOS 3.1/PC Network Program, 3COM's 3 Plus, or Novell's Advanced NetWare Version 1.01 or higher. Other local area networks that use a 100 percent PC-DOS 3.1 compatible operating system may also support dBASE III PLUS and dBASE III PLUs LAN Pack.

Ashton-Tate also introduced today the dBASE cTOOLS Series for dBASE III PLUS, two add-in packages designed to help programmers develop applications using the company's new database management system. Developed through the company's Publishing Group, these packages - The Programmer's Library and The Graphics Library - allow users to add functions, commands and programs written in the C language to dBASE III PLUS applications. ●

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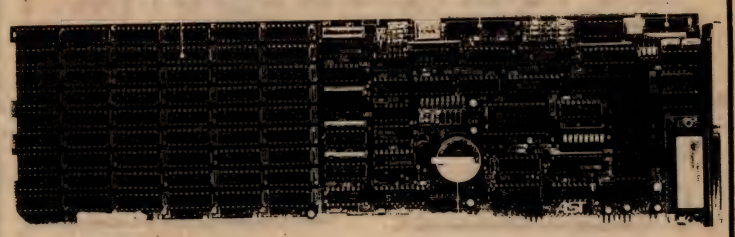

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Microsoft Word Made Easy

by Tom Garcia

While building my Heath-Zenith Z-150 computer, I had occasional flashes of trauma concerning the forthcoming switch over from my previous word processor to the new program, Microsoft's *Word*, supplied by Heath with their kits. How could I get up and running quickly? The kit building project was taking enough of my time as it was, without a lengthy self-training project on the *Word* package. So, I took a trip downtown to the B. Dalton Bookstore to see what I could find in the way of guidebooks. I had heard that the Microsoft documentation for *Word* (which I had not yet looked at) left something to be desired. The manual has been called (prior to release 2.0) "disorganized, confused, and poorly indexed." Dalton's had three books in stock that were all about *Word*. Two were priced at $16.95 and one was $14.95. Fortunately, I had read something complimentary about one of the books in *Computer Shopper*. It was *Microsoft Word Made Easy* by Paul Hoffman and that was the one selling for the lower of the two prices, so I bought it.

The book is 246 pages in length and set in an easy to read type style. It would be nice if it could be laid flat on your workspace but the binding is not correct for that manner of use. The first four pages give an overview of the book and if you are in a hurry you can skip them. Next, there is a 17 page section on "Getting Started." If you have ever used any kind of a word processor you can just skim those pages. Now we are into the heart of the book, Chapter One, all about editing and saving text. But, you might want to skip right back to Appendix E before doing anything else because it is here that you are told how to install *Word* with your computer system. The procedures are written mostly for people who are using the IBM-PC, AT, or PCjr, but those with similar machines will have no problems with the instructions. You are told how to make backup copies of the *Word* Program Disk and also the *Word* Utilities Disk.

The major difference in installation and use of the word processor will depend on the number of drives available to you. PCjr users often have only one drive. Information is also given in Appendix E for use of the program with hard disks and RAM disks. If you have a Microsoft mouse then your directions for that installation will be in this same section. From what I read in the Appendix I get the feeling that I would be happier with a PC mouse from *Mouse Systems*, (their address is given.) Keep in mind that Microsoft has recently released an improved version of their mouse which may put them more on par with *Mouse Systems*.

As long as you are back in the Appendix section, take a look at Appendix F. Other programs that will work with *Word* are mentioned here. The *Word Plus* from Oasis Systems is recommended as a spelling checker.

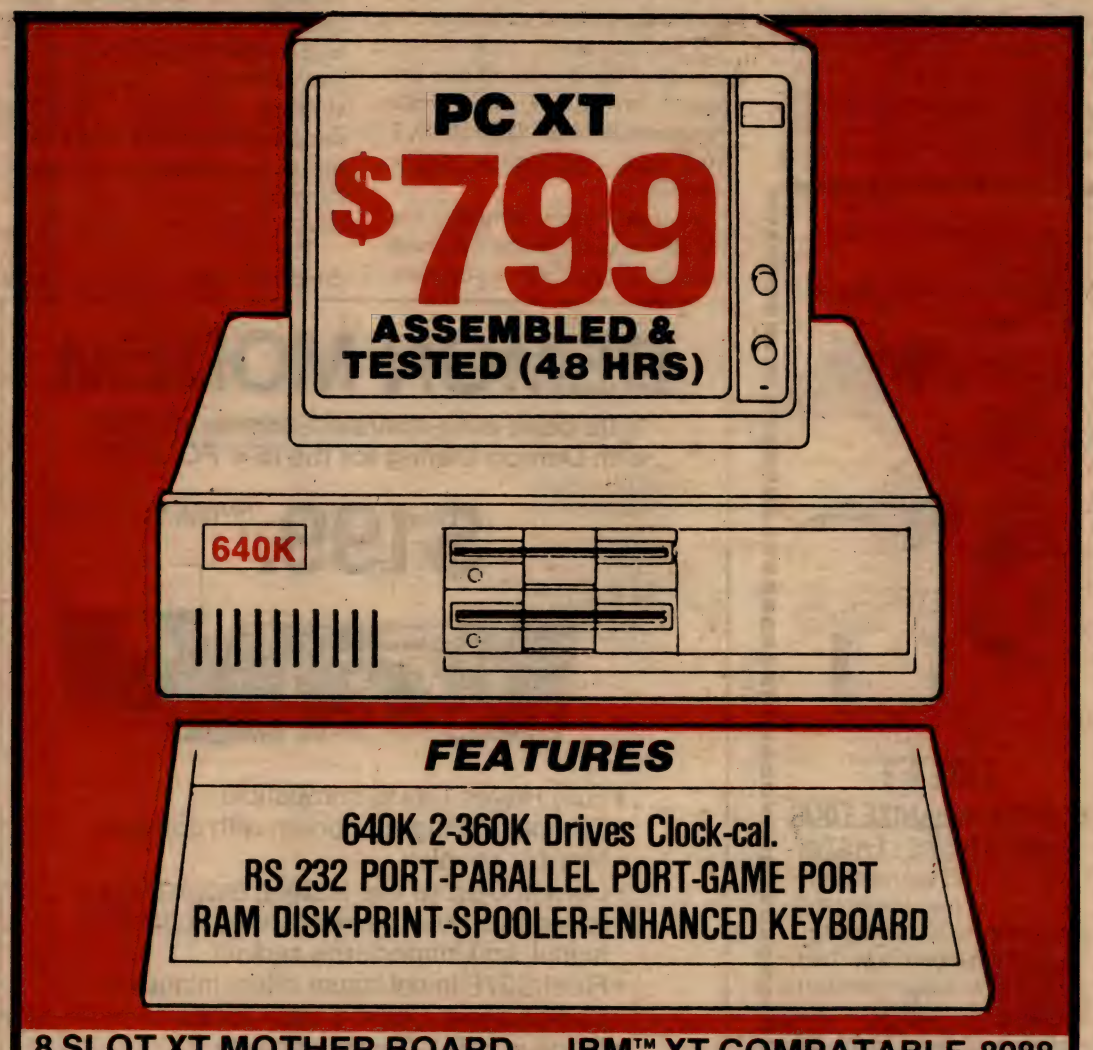
Even though the copyright date on this book is 1985 the author does not cover *Word* Version 2.0 with its 80,000 word built-in dictionary. Only Versions 1.0 and 1.1 are specifically mentioned. (He missed Ver. 1.15 also.) Heath supplies Version 1.1, without a dictionary, with their kits.

After telling you that you need a keyboard enhancer program if you want to do "many functions with only one keystroke" the author gives *ProKey* from RoseSoft high marks. Then he tells you that *ProKey* won't work with *Word*! He is right when it comes to the earlier *Word* releases but I'll tell you that *Word* and *ProKey* exist together quite nicely if you have *Word* 2.0 or better.

Other areas of the Appendix are valuable except for the one page long section which tells you about *Word* on non-IBM computers. Beyond a minor mention of the Tandy 2000 and the AT&T line of machines there isn't anything there to justify having the section.

The bulk of *Microsoft Word Made Easy* consists of 13 chapters subdivided into 60 "lessons." Each lesson covers some very specific facet of *Word* such as "Moving Windows," "Indenting Paragraphs" or "Creating Multi-Column Text." Review questions (the answers are in Appendix I) follow each chapter and, as the author probably had in mind, the book would be easy to adapt for classroom use.

Appendix information on altering printer drivers will no doubt be of value to some readers. Other charts and tables are handy too. To sum up: I'm glad that I bought the book as the time saved in getting up to speed with *Word* was certainly reduced and I'll continue to use the book as a reference until I really know *Word*. ●



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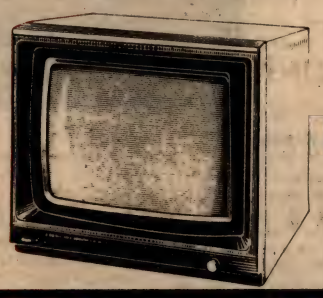

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New Bernoulli Box Adaptor Card

Booting directly into the operating system of an IBM PC/XT or AT is simplified with the introduction of a new adaptor card for IOMEGA Corp.'s Bernoulli Box data-storage subsystems. With the new card, the Bernoulli Box also eclipses the hard-disk access speeds of the IBM PC/XT by 30 percent and the IBM AT by approximately 10 percent.

Showcased at COMDEX/Fall '85, the PC2B adaptor card instructs a Bernoulli Box to load a computer's operating system automatically from an IOMEGA disk cartridge when the PC is turned on, eliminating the need to use operating-system diskettes.

The superior disk-access speeds of the Bernoulli Box are based on direct read/write comparisons with IBM PC/XT and AT hard-disk drive systems.

Among its user benefits, the PC2B card supports the most recent PC disk operating system (DOS) commands and features menu-driven utilities, and enhanced back-up restore capabilities.

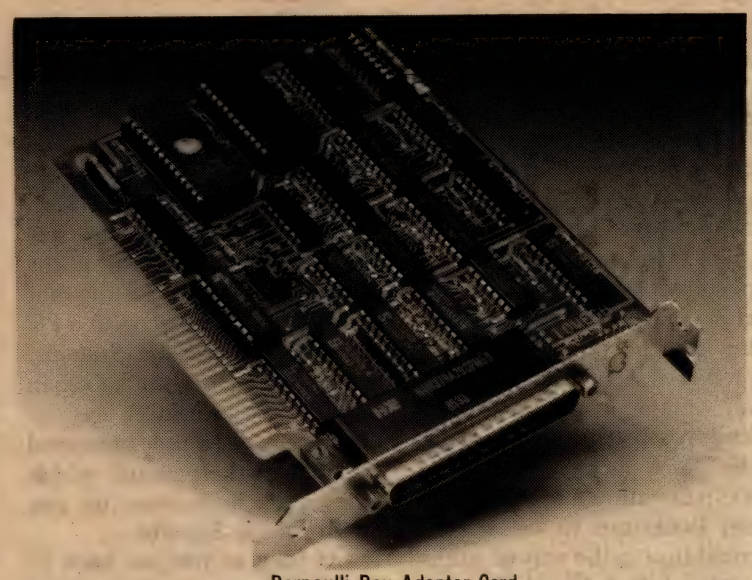
IOMEGA disk drives combine the performance and capacity features of Winchester fixed disks with the media-removability benefits of traditional floppy disks. In addition, Bernoulli technology using flexible media makes IOMEGA products highly resistant to vibration, contamination and other problems that cause "head crashes" in conventional hard-drive systems. Rugged cartridge design ensures data safety during transportation; cartridges can even be mailed from site to site without fear of data loss.

The cards are packaged individually and separately from the Bernoulli Box units, allowing users to select the most appropriate card for their subsystem.

The PC2B card sells for $255, the PC2 card is $155. There is an upgrade kit to convert the PC2 to PC2B for $110.

For more information contact IOMEGA Corp., 1821 West 4000 South, Roy, Utah 84067. (801) 778-1000.

Mention that you read about it in *Computer Shopper*. ●



Bernoulli Box Adaptor Card

ANSA's Paradox continued from page 101

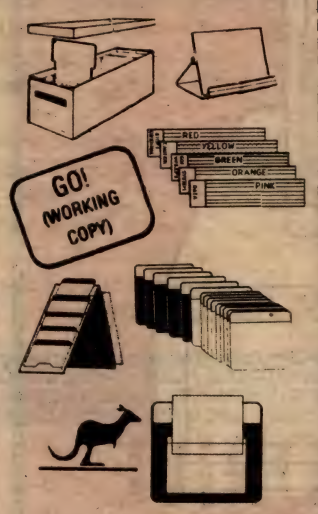
must really be experienced to be understood; to say that it is significant is an understatement but it is the best description available.

If it is desired to view one of the initial tables or the "Answer" table in a particular order, the table may be sorted (by utilizing the "SORT" option in the "MODIFY" menu). The sorting may be performed on a multi level basis with each sort key sequenced in either ascending or descending order. The output of the sort may either overlay the initial table or be set up in a new table. Additionally, tables may be maintained in a desired order through the use of "KEYFIELDS." Key fields are identified in the file's structure and must be the first fields in the file (if multi-fields are used, they must be listed in the file definition in the order in which they are keyed; the first of multi-keys is called the "primary key field"). The keys for a Paradox file, unlike dBase files, must be unique. The use of keys prevents duplicate records in the file, creates an index on the key fields to speed queries and keeps the table sorted as desired. On the negative side, the use of keys shrinks the maximum record length from 4000 bytes to 1350.

Paradox's reporting capabilities are also strong and provide for tabular or free form reports (such as Mailing Labels), automatic sequencing and subtotaling for intermediate controls, summary reporting with and without detail, easy placement of text (literals), date, time and page numbers within the reports, calculations within detail records, printer string control and other features found in high level data base systems. We found the report specification more difficult for the uninitiated than dBase III's but a good deal more powerful.

In addition to the basic functions described above, Paradox performs various other utility functions, such as copying of tables, forms and reports, providing password protection and encryption for security purposes and DOS directory manipulation. Of these functions (found in the "TOOLS" menu), one of the most interesting (and one that leads us back to the discussion of Artificial Intelligence) is the "QUERYSPEEDUP." This function is intended to optimize queries that are to be performed frequently. When the choice is selected, Paradox builds a secondary index for each non-key field in the current query for which a selection criteria has been entered.

continued on page 106



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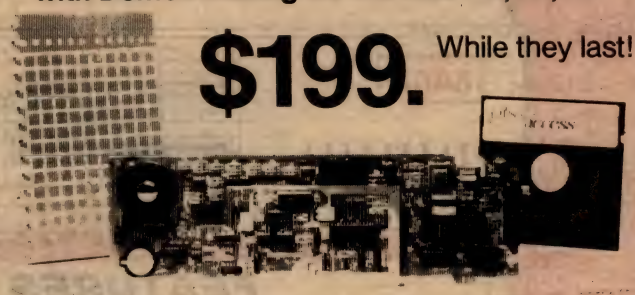

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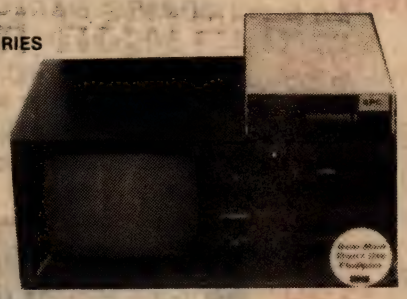

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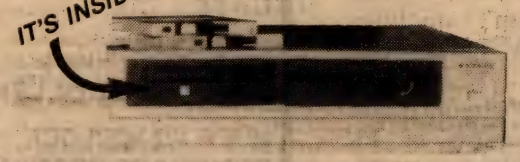

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Intel's New PC-Bubble Card Evaluation Kit

Intel Corp. recently introduced a hardware card and software development package that halves evaluation time for Intel's 4-megabit magnetic bubble memory components.

Intel's PC-Bubble Card is designed for IBM Personal Computers and compatibles, and includes either 512 kilobytes or 1 megabyte of bubble memory. Designated PCB-75, the evaluation package includes the 4-SITE software, an interactive program that allows designers to quickly learn to program the 7225 bubble memory controller. Using the hardware card and software package, system designers can build prototype evaluation systems for such applications as numerical machine and process control, robotics and point-of-sale terminals. These applications require the tolerance to harsh envirnoments that bubble memory offers.

"PCB-75 lets engineers use an IBM PC as a design tool for incorporating bubble memory into their applications," said Ulmont Smith, product marketing manager of Intel's Magnetics Operation. "Also, Intel's 4-SITE evaluation software provides a tutorial on how to establish software communications with the 7225 bubble memory controller."

Two versions of the PC-Bubble Card are available, both with 4-SITE software. The PCB-75-1 has one 7114 4--megabit bubble memory component, the PCB-75-2 has two bubble memory components. The two-bubble version is intended for users designing systems that incorporate two or more 4-megabit components with a single controller. The 7225 will support up to eight 7114 components, providing a total of 4 megabytes of reliable non-volatile storage.

4-SITE software allows all fundamental bubble memory operations to be performed through simple commands typed on the PC's keyboard. In addition, 4-SITE software provides a complete display of the 7225 controller's registers and data buffers for easy configuration and programming.

A 96-pin DIN connector allows the PCB-75 to be interfaced to systems that do not use the IBM PC bus structure. The connector can also be used to monitor controller signals or to daisy-chain additional PC--Bubble Cards for evaluation of systems using up to eight bubble memories.

Price and Availability

Both versions of Intel's PCB-75 are available now. The PCB-75-1 sells at $495 each; the PCB-75-2 sells for $795 each.

For more information, contact Intel Corp., Literature Dept. W-271, 3065 Bowers Ave., Santa Clara, CA 95051. ●

Multi-Purpose Disk Subsystem for "Extra Drive"

A multi-purpose Winchester disk subsystem that provides users with an "extra" hard disk system designed to operate on the IBM PC, XT, AT and compatible personal computers has been introduced by I2 Interface, Inc.

Designated the Extra Drive, the subsystem can be used on computers with or without existing hard disk drive systems and is available with either a removable cartridge Winchester or fixed Winchester drive. The ExtraDrive's fixed Winchester disk drive is available with formatted storage capacities ranging from 10 to 119 megabtyes. The cartridge drive has 10 megabytes formatted storage.

The ExtraDrive was developed to provide users with a second, independent hard disk subsystem, a subsystem that allows data and drives to be interchanged between the PC, XT, AT and compatibles, and a disk system that can function as Winchester backup or for additional storage.

An advantage of the ExtraDrive is that it is interchangeable between personal computers, which is an innovative feature of the ExtraDrive. For example, in a multi-computer installation, the drive and its data can be easily interchanged between computers by simply plugging it into another computer. The drive and data can be used between an XT and AT, an XT and another XT, an AT and a compatible personal computer, etc., providing the user with the maximum flexibility.

The ExtraDrive can also function as a Winchester backup system. It was noted that many users prefer a redundant Winchester backup system rather than relying on current tape technology.

Available with the ExtraDrive is the choice of a removable cartridge disk drive, which has the advantage of data security, plus the removable cartridge can be used as a backup device.

The ExtraDrive is similar to Interface's standard external Winchester DiskSystem. A host adapter card is provided so that the user only needs to open the computer system once for installation. There are no system switch settings required and installation can be completed in ten minutes.

With the ExtraDrive, Interface offers a choice of formatted storage capacities with the fixed disk including 10, 21, 32, 42, 55, 87 and 119 megabytes. Average access times range from 28 to 85 milliseconds depending upon the model. The ExtraDrive comes complete with cabinet, power supply, and cabling. All Interface drives are tested before shipment including a 48-hour burn-in.

For more information on the ExtraDrive, contact I2 Interface, Inc., 21101 Osborne Street, Canoga Park, CA 91304; (818) 341-7914.

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ANSA's Paradox
continued from page 104

This process will greatly speed up repetitive queries.

AI?

If queries can be speeded up in the above fashion, why aren't they initially set up in that manner? Because the indexes take both time to create and update as well as disk space for storage and this overhead is not practical for occasional inquiries. HOWEVER, Ansa tells us that the initial queries are analyzed through state of the art Artificial Intelligence methods and optimized by whatever means necessary (ex. setting of indexes, generation of searching algorithm, etc.) for maximum query performance. While many are skeptical about the use of so-called AI techniques in programs like Scarborough Systems' "The Original Boston Computer Diet," the performance of Paradox in query processing is such that we have no reason to doubt that the process has been optimized in some manner or other. Additionally, it is our feeling that much of the initial impact of AI will be at this subterranean level where it performs a significant function yet its presence is not obvious to the user--much like a microwave oven that, rather than responding to a preset timer, monitors the actual cooking of the meal and adjusts the temperature and cooking duration accordingly. So if Ansa calls it Artificial Intelligence, Artificial Intelligence it is!

Powerful Programming Language

The "PAL" language is, in many ways, a developer's delight. The powerful command set contains more commands than dBase III, includes the ability commands to easily generate the user defined menus in the Paradox/1-2-3 format and allows for unlimited variables. It has a built-in editor and debugger and provides code encryption to hide the developed program from others. In short, this is a solid programming language (we do wish, however, that it had stayed as close as possible to the dBase language; instead, dBase's "Do" became "PLAY," "Do Case" became "SWITCH," "Do While" became "WHILE," etc. It would have been easier for dBase programmers if a closer similarity could have been accomplished). Beyond the basic soundness of the language, there is the interaction with queries and keyboard execution of commands that Paradox provides. We cannot praise the programming language enough.

Documentation And Support

The system comes with an introductory guide, two manuals (*User's Guide* and *PAL User's Guide*) and two pamphlets (*A Quick Guide to Paradox for Lotus Users* and *A Quick Guide To Paradox for dBase Users*). We found all of the documentation to be of a high quality and complete with examples. There is also on-screen documentaion through an extensive "HELP" function. there is also telephone "hotline" support available (we have tested this service and found the Ansa representatives helpful and courteous).

A Perfect Progam?

Does Paradox have faults or room for improvement? Certainly; all programs do!) It doesn't always run properly with Lotus' "Spotlight" (a particular favorite of ours) resident in memory (and the error messages provided on the screen as the system fell out of the program are abysmal); it "eats" memory (it requires a true 512k computer--we tried to run it on a 512k Data General One and were unable to because the DG1 steals some 40k of memory for LCD screen management) and disk space, the "EXPORTIMPORT" program that translates files works very well but would be outstanding if it can be modified to selectively translate files, there is no run time system for developers (although one is rumored), the cost is too high, there is no networking capablity, the user cannot use her/his existing editor from within the program (as in daBse), etc. From conversations with Ansa principals, we know that points such as these are being worked on and should be resolved in subsequent versions (as stated earlier, Ansa has announced that a new version with multi-user capability will be released at some not-so-distant day in the future).

continued on page 108

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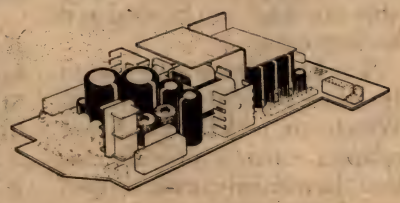
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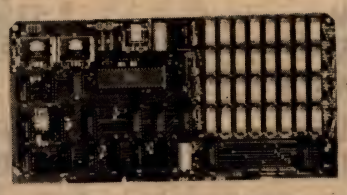
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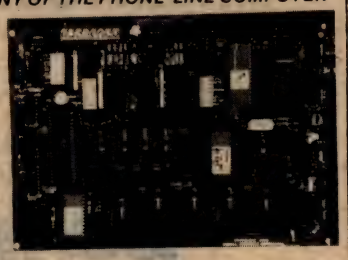
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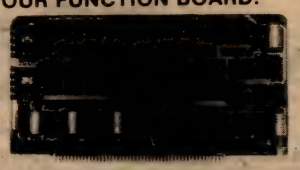
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Moving Applications From dBASE to 'C' Made Possible

Desktop A. I. has released a translator that allows moving dBASE programs into the 'C' language. This programmer's tool is a result of nine months collaboration with a multi-computer VAR and the translation of 100,000 lines of dBASE code into finished 'C' programs. The dBX Translator system includes a language translator for processing dBASE source and a run-time library tool box to replace the dBASE screen handler. The system is designed to work with any 'C' language database manager. Once converted the dBASE code becomes a fully functional and controllable 'C' program giving an application developer complete control over his product and release from the problems and royalty costs of dBASE. The dBX Translator system allows conversion of dBASE applications for speed and improved performance or for multiuser and network applications. In addition, applications can be moved to machines where dBASE is not available such as the AT&T 3B2 under UNIX, Altos under XENIX, and Macintosh or Amiga systems.

The system is programmed in standard 'C' and produces standard 'C' from dBASE code. The action of the dBX Translator ranges from complete translation of some dBASE statements to commenting out other statements that have no parallel in 'C'. The programmer then converts those functions that are too different to allow automatic translation. The run-time tool box includes a full function dBASE-like screen handler and database interface facility. The run-time library provides the 'C' functions that dBASE has built-in and allows dBASE applications screens to be functional rapidly without major programming effort.

The dBX Translator automatically handles the tedious error prone parts of the translation process and assists the programmer in dealing with sections that require significant logic changes. The translation guide book provides programming tips and translating techniques about changing dBASE code into appropriate 'C' code to further assist the programmer.

This system opens whole new markets to vertical applications developed under dBASE while minimizing the programmer effort in making such transistions. Available under MSDOS, (using the ANSI screen handler) UNIX and XENIX, (using the CURSES screen handling packages) and will be available soon for the Macintosh and Amiga. The package price ranges from $350.00 to $1000.00 depending on system configuration. The package is available immediately.

For more information or orders contact Desktop A. I., 1720 Post Road East, #3, Westport, CT 06880; (203) 255-3400.

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Natural Language Speech Recognition Breakthrough

Recently, in a presentation at Omni Park Central Hotel in New York City, Dragon Systems, Inc. demonstrated a technical capability which represents a major milestone in cost effective, high performance speech recognition. Dragon Systems demonstrated application specific natural language recognition running on a standard personal computer with hardware which costs less than $6000. Previous demonstrations of natural language speech recognition have required large computer systems costing more than 100 times as much. Dragon Systems, a leading supplier of speech recognition technology to Original Equipment Manufacturers, points out that the demonstration system is only an experimental prototype and no product announcement has yet been made. However, it is estimated that the final retail price of a complete system including the recognition technology demonstrated recently by Dragon will be under $10,000.

Natural language consists of normal sentences you use when you are writing or speaking to another person. Natural language contrasts with the artificial sequences of commands and codes that you use when you are controlling a typical computer program. The Dragon Systems recognizer can recognize such natural sentences as long as you pause briefly after each word and keep to a 2000 word vocabulary. You may customize the Dragon Systems recognizer to the vocabulary and language of your specific application (medical, financial, legal, etc.). This capability promises professionals in all walks of life the opportunity to produce "documents on demand" much more quickly and conveniently than ever before.

When asked how Dragon Systems has achieved this remarkable breakthrough,

continued on page 162

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ANSA's Paradox
continued from page 106

Bottom Line

Paradox is, in our judgment, an outstanding technical achievement that deserves success in the business and professional marketplace. Its pleasing user interface and overall power make it attractive to a wide range of users in this market and its demerits are not of a magnitude to devalue the program; the only stumbling block to such success is possible difficulty in getting into stores, in getting "shelf-space." We feel that the Sevin-Rosen name and knowledge should be sufficient to overcome this obstacle. We thus strongly recommend PARADOX to all potential users.

Paradox- a relational data base product for IBM PCs and "true compatibles;" requires 512k, two floppy disk drives or one floppy and one hard disk drive, DOS 2.0 or higher. Suggested retail price--$695.

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Jameco Releases 1986 Catalog

Jameco Electronics, established in 1973 as an electronics retailer/wholesaler, has released a new 80 page illustrated catalog listing over 3,800 items. Product lines include everything from integrated circuits to computer peripherals. Numerous pages are dedicated to Apple, IBM, Commodore and TRS-80/Tandy computer peripherals/accessories. New feature this year: 8 pages of valuable integrated circuit pin-out data included inside. Jameco's 1986 catalog is an ideal source for the electronics/computer enthusiast. Send $1.00 postage for your FREE 1986 Catalog today.

For additional information contact Jameco Electronics, 1355 Shoreway Rd., Belmont, California 94002; (415) 592-8097.

Mention that you read about it in *Computer Shopper*.

IBM XT® COMPATIBLE

SPECIFICATIONS	
Processor	8088 CPU and socket for 8087 numeric processor
Clock rate	4.77 MHz
ROM	12K
RAM	128K (Expandable to 1MB)
Expansion slot	8 IBM PC compatible slots
DMA	4 channels
Timer	3 channels
Interrupts	8 levels of vectored interrupts
Parallel port	1 Centronic printer port
Keyboard port	1 five-pin connector for an IBM PC compatible keyboard
Reset port	A reset switch for hardware reset
Serial port	2 serial interfaces RS-232, 110 to 19,200 baud
Speaker port	1 connector for external speaker
Floppy drive port	Controls up to four drives
Hard disk port	Host adaptor built-in to interface with hard disk controller
Color display board	High resolution 640 x 200 40/80 x 25 text display RGB and composite video connectors are available
Disk drive	Two 5¼" floppy disk drives 320K bytes per drive option for hard disk - 5MB, 10MB or 15 MB
Key board	IBM-PC compatible
Power supply	130 watts, 110/220VAC, 50/60Hz

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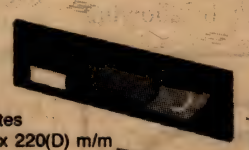

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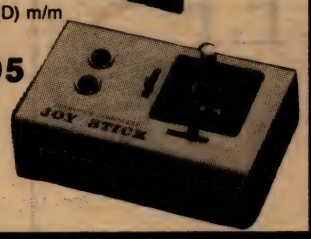

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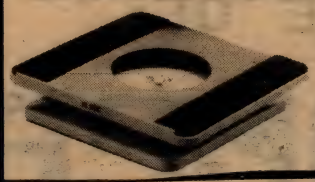

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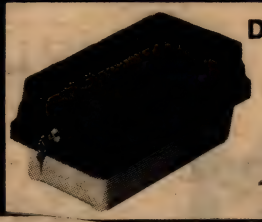

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New KnowledgeMan/2® And A Million Dollar Contest To Promote It

Micro Data Base Systems, Inc. (mdbs) will begin soon to ship KnowledgeMan/2, a new software package merging all the familiar business applications into one program.

According to Dr. Gary Hoehler, mdbs president and chief executive officer, the company will support the product introduction by conducting a one million dollar contest, thought to be the most lucrative promotion in the history of the microcomputer software business.

"The contest underlines our confidence in KnowledgeMan/2's ability to compete favorably with other leaders in business software," Koehler said. Entrants in "The $1,000,000 Switch" are asked to submit an essay on why they selected KnowledgeMan/2 over other brands of competitive software. $800,000 will be awarded to the winning entrant. Two $100,000 prizes will be awarded as incentives to registered KnowledgeMan/2 dealers and value-added remarketers and their sales people. All prizes will be paid in 25 annual installments.

$1,000,000 KnowledgeMan Contest

"KnowledgeMan/2's mix of power, ease-of-use and fluid integration of features prompts us to go to these great lengths to encourage people to compare it with the competition," Koehler said.

"KnowledgeMan/2 provides a sophisticated information management tool even to casual computer users," said Koehler. "Most other powerful data management software require fairly advanced computer literacy to operate. KnowledgeMan/2 changes that by featuring easy to use menus and generous help screens to guide the user step-by-step through the data entry and retrieval processes," he said. An optional natural language interface, called K-Chat™, further simplifies use of KnowledgeMan/2 by allowing the user to ask for information in plain English, Koehler added.

KnowledgeMan/2 blends the familiar business information processing capabilities of spreadsheets, stastistical analysis and forms management with powerful relational data management. "Relational" means that pieces of information which share something in common but are located in separate tables of the data base may be connected for retrieval and processing purposes. A relational data base is a particularly effective business tool because it allows the user to "discover" relations in a large body of data which would be hidden in less advanced data managers. For instance, one table in the data base may contain all of a law firms' associates' hourly rates and another table may contain their annual salaries. If the managing partner were to request a list of all associates earning more than $45,000 and that group's average hourly rate, comparable entries in both tables would be matched and processed to fulfill the request.

KnowledgeMan/2's powerful data management capabilities create a new dimension for the package's other processing tools which is not often found in business software, Koehler said. "Data base management is the backbone of business processing. Everything else is either a way of looking at the data or a way to manipulate it. By providing state of the art data management in a form everyone can use, we allow people to make the most of spreadsheets and other ways of looking at information," he said.

"With the seamless integration of spreadsheet, forms management, data management and other KnowledgeMan/2 capabilities, you can literally crunch numbers while you file and vice versa. The result of a data base query can be automatically entered into the appropriate row and column space of a spreadsheet, and the spreadsheet will be recalculated accordingly," Koehler explained.

For example, a marketing manager might ask KnowledgeMan/2 for the latest total of travel expenses for the Chicago sales office. As that figure is reported, it is also worked into the spreadsheet the manager uses every month to review corporate marketing budgets. After calculating the monthly

continued on page 162

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Typ-Set
continued from page 111

cessing or CAD (Computer Aided Design) software package," according to Curtis. "The market for fonts is surprisingly broad, encompassing not only graphic arts but the entire spectrum of "digital image setting," including graphic arts, office automation, publishing, videotext, slide generation, computer aided design and artificial intelligence image processing equipment."

TYP-SET RELEASE 2.0 can now be used with many popular printers from such manufacturers as Epson, C. Itoh, Fujitsu and Texas Instruments.

For higher resolution and more vibrant colorful output, **TYP-SET** (Release 1.0 and 2.0) can also be used with **Enter Computer's** six-pen Sweet-P 600 or on many other popular plotters from such manufacturers as Hewlett-Packard, Houston Instruments and Calcomp.

TYP-SET generates graphic art quality lettering in many font styles with a wide selection of lettering spacing, shading and colors. According to **Enter Computer**, the softare can create characters ranging in size from tiny .05 to a huge 72 inches in height, without distortion, a capability not found in any other microcomputer software.

"For example, **TYP-SET** can be used in a two-step process, with any graphic application software written for the IBM PC, by commercial artists, architects, engineers, salesmen and professionals in every occupation," says Curtis. "Anyone needing to create colorful, high-impact lettering for professional attention-getting reports, proposals, organization charts, engineering projects, layout designs, or overhead projection of transparencies, can use our software to quickly and simply create 'first drafts,' drafts which can be stored on disks or diskettes, easily edited or changed later for output on a plotter or printer."

Curtis explains that, once a PC user has created a visual image of information, using any graphic application package written for the IBM PC, he or she can then simply insert the **TYP-SET** software diskette into the microcomputer and label the graphics with appropriate lettering, using keyboard and screen.

TYP-SET's large-size, high quality, "camera-ready" output is due to each character being designed mathematically. "Other software lettering packages use public domain 'Hershey' fonts drawn electronically point-to-point, using 'stick' figure, small line segments," says Curtis. Those software packages can only produce characters up to 1 inch in height and one can see distortion beginning with ½-inch-sized letters, a distortion that gets progressively worse up to one-inch letters, and magnified when projected on a screen.

TYP-SET automatically calculates the multiple arcs within each letter or number and adjusts the radius according to what type of output the user demands at his or her computer.

Enter Computer's TYP-SET enables text to be mirrored or reversed with spacing controlled to create gapped or overlapped lettering. Letters, numbers or punctuation marks can be spaced proportionally with automatic kerning (part of character projecting beyond its body) or spaced for alignment in a column, in any number of colors. All fonts can be presented as designed or in condensed, extended or italic styles with related text comprised of mixed fonts. Lettering can be mixed upper/lower case.

PC and compatible micro users have control over many functions:
— height, width and spacing
— right, left and center justification;
— shading to any density; and
— 360-degree rotation of text.

For more information contact: **Enter Computer**, based at 6867 Nancy Ridge Dr., San Diego, CA 92121; Tel. 619/450-0601.

Mention that you read about it in *Computer Shopper.* ●

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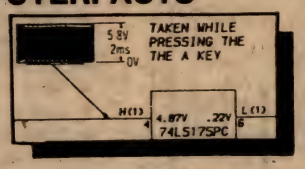

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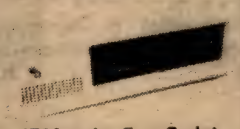

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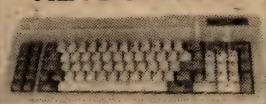

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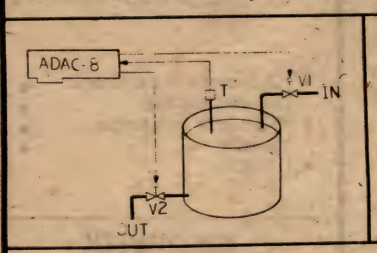

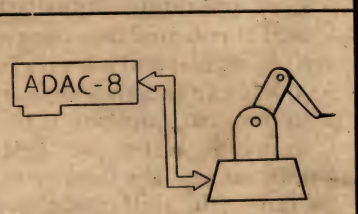

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Voice Recognition Software With Large Vocabulary

A voice recognition software system for under $400, featuring the largest vocabulary available, has been introduced by InterPath Corporation, Santa Clara, California.

VoiceCommand allows personal computer users to verbally operate popular application programs such as Lotus 1,2,3 and Wordstar. The system helps both experienced and novice personal computer users easily access the power of the IBM PC, XT and AT. VoiceCommand allows the computer to recognize and accept the user's voice as an alternative to keyboard entry of commands and data.

VoiceCommand users define common commands such as "create graph," "initialize program" and "save data," all of which remain in the system for future use with any software. These verbal commands reduce significantly the time and complexity involved in the computer's use.

The system's 500-word vocabulary, the largest in voice recognition software, allows for multiple 500-word segments to be overlayed, thus expanding the vocabulary up to 8000 words.

VoiceCommand has a "menu option" whereby users define voice menus, thus replacing those of standard software. Furthermore, the menus can be linked together to form a complete voice system, allowing inexperienced software users to apply simple terms to access and utilize the system.

In the development of VoiceCommand, InterPath looked at potential new users as well as regular software users. Not only can experienced users gain from the simplicity VoiceCommand creates, but first-time users can now become familiar with and productive through the computer--without formal and extensive training.

"With VoiceCommand, useful voice recognition technology has at least reached fruition," said InterPath president John McAfee. "The system's extraordinary capabilities and low cost should bring speech interface and control within the grasp of every computer user. Our goal of creating a more natural and human link to the computer has been achieved."

The VoiceCommand system includes the software, microphone, plug-in board and instruction manual. Available directly from InterPath, the system sells for $399.

InterPath Corporation, founded in 1983, supplies software, interface hardware and access tools for personal computer users.

For further product information contact InterPath Corp., 3333 Bowers Ave., Ste. 253 Santa Clara, CA 95054; (408) 988-3832.

Mention that you read about it in *Computer Shopper*. ●

Typ-Set

continued from page 98

truly professional presentation," says Bob Curtis, Enter Computer's vice president of marketing.

In the U.S., **TYP-SET** is marketed through various distributors including Softsel. Internationally, Enter Computer's English and foreign language fonts are marketed through distributors in Western Europe, the Middle and Far East, a network totalling more than 25 countries.

"Digitized fonts, for the OEM and value-added market, are easily adapted to any current software and can reside in the printer or plotter, or in the graphics, word pro-

continued on page 112

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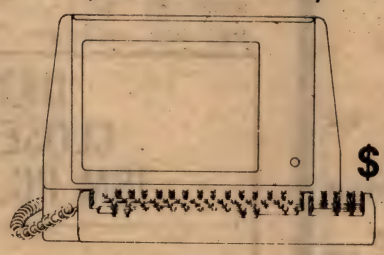

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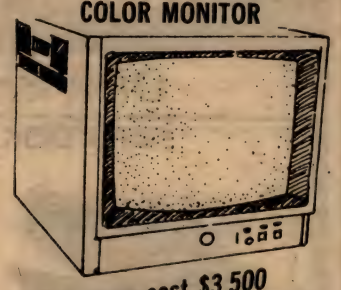

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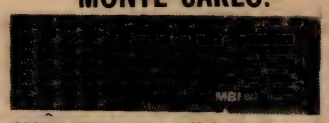

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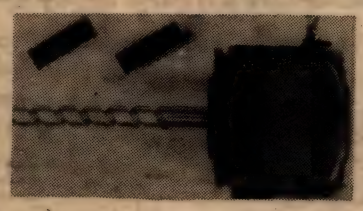

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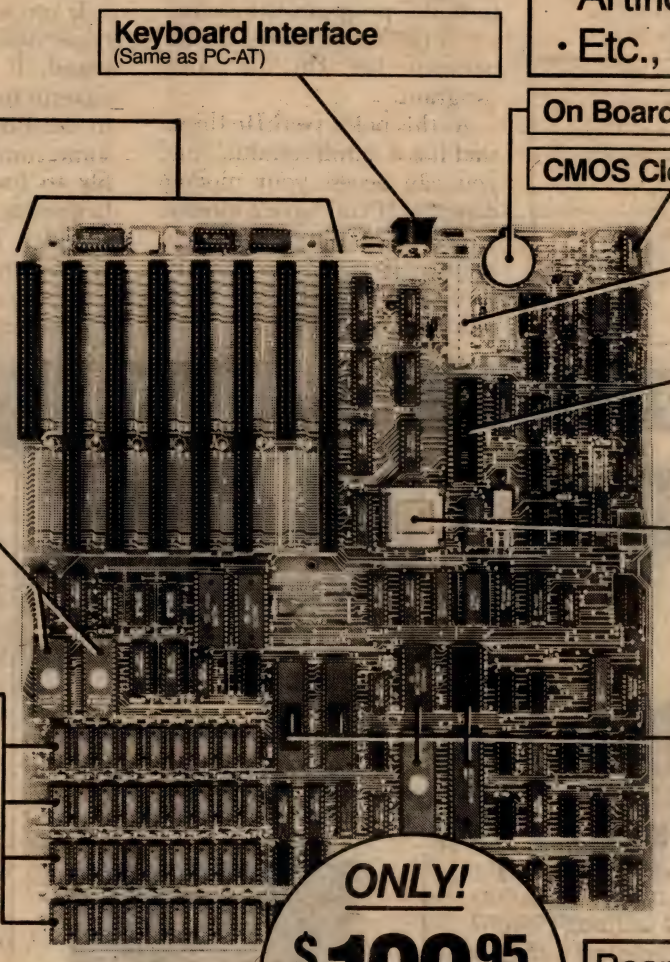

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RS-232 Cables continued from page 57

an accidental solder bridge between two cups.

After you have soldered together the cable, make sure that you can't accidentally short any of the wires together (if necessary wrap the wires with electrical tape or heat shrink tubing) and screw on the hoods.

Shut off your soldering iron before you burn a hole into your workbench! Then shut off your Macintosh and modem before wiring them together. Plug the DB-9 connector into the Macintosh's modem port (the one with the phone Icon) and the DB-25 connector into the modem. Turn on your Macintosh and modem. If you see any smoke, or smell anything burning, shut off everything, and check to see what went wrong.

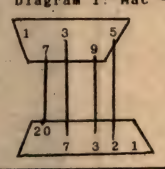
Hopefully everything will be okay. At this point your Macintosh should show its normal happy face. You can now run any terminal program which is designed for the Apple Modem, as long as the program doesn't use any features your modem doesn't have. (e.g. if you use a modem with an accoustic coupler, don't expect your terminal program's dialing routines to work). If your modem has special features, you may be able to use them, depending on the capabilities of your terminal program.

If You Have An Apple IIc:

Parts needed: DIN 5 Male connector; DB-25 Male connector and hood; about 1 meter (3 feet) 4 conductor cable.

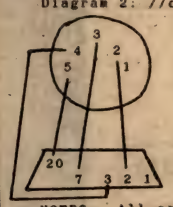
Wiring a IIc modem cable is almost identical to wiring a Macintosh cable. The only difference is that the IIc uses a DIN 5 connector instead of a DB-25 connector. Follow the directions given for the Macintosh cable, but use Diagram 2, and a DIN 5 connector instead.

Diagram 1: Mac - modem cable



DB-9M	5	9	3	7	
	TXD	RCD	GND	DTR	
DB-25M	2	3	7	20-6-8	

Diagram 2: //c - modem cable



DIN-5	2	4	3	5	
	TXD	RCD	GND	DTR	
DB-25M	2	3	7	20-6-8	

NOTES: All connectors are male connectors. Some modems don't require pins 6 and 8 to be connected.

TXD - TRANSMIT DATA
RCD - RECIEVE DATA
GND - SIGNAL GROUND
DTR - HANDSHAKE

In order to use the IIc with a modem you can either use a terminal program (e.g. Access II, Apple Term, Softerm, ASCII Express Pro, Data Capture) or access the modem directly using the IIc's built in firmware.

To access the IIc modem firmware, enter Applesoft BASIC (the "]" prompt) and type in the following commands: (^indicates that you should type in the following character as a control character, e.g. ^A = CTRL-A).

]PR#3 ;this turns on the 80 column mode.

]IN#2 ;this sets up the firmware.

]^AT ;CTRL-A T enters the terminal program firmware.

_ ;The underscore is the prompt for the terminal program.

At this point your IIc thinks that it is a dumb terminal, and you can access your modem directly. If you have a modem which uses the "AT" commands (e.g. Hayes Smartmodem, Prometheus Promodem, Novation Smartcat, etc.) then the following command will dial Telenet through its 800 number in Touch Tone mode:

AT T D

1-800-424-9494#;spaces and dashes inserted for clarity

When the modem detects a carrier the phrase "CONNECT" will appear on your screen. If the modem doesn't get through within thirty seconds, then "NO CARRIER" will be displayed.

When you want to disconnect your modem from the phone line wait a couple of seconds, type "+ + +," and wait until the prompt "NO CARRIER" appears. While in dumb terminal mode, you can use all of the "AT" commands described in your modem's manual.

Be careful not to type the forward arrow, or CTRL-U while in terminal mode, it will change you back to 40 column mode.

If you want 1200 baud, then type^A6B after the ^AT command. If you don't want 80 column mode, then don't type in the PR#3 command. With some combinations it is possible to lose characters at the beginning of each line at high speeds. If you are losing characters, tell the system you are on to send a couple of nuts at the beginning of each line, or type in "POKE 34,2" after the PR#3 command. The poke will decrease your screen window from 24 to 22 lines. Since less information is scrolled, no characters will be lost.

When you are finished with the terminal mode, ^AQ will put you back into BASIC. The above directions will get you started. If you want to learn more about the IIc's terminal program, it is fully documented in the Apple IIc Reference Manual, Volume 1 Chapter 8 (Apple p/n A2L4030).

The built in terminal program in the IIc is satisfactory for simple dumb terminal applications, but if you want to transmit files, upload or download messages, or emulate another terminal, then you will need a terminal program. ASCII Express Pro is one of the most powerful terminal programs made for microcomputers, and the latest releases support the IIc, both in DOS 3.3 and ProDOS. A free demo copy of AE Pro which will show off its major functions is available to *Computer Shopper* readers by calling, or writing the program's distributor United Software Industries. Their phone number is 1-213/556-2211, and the address is: 1800 Century Pkwy. E., Suite 311, Los Angeles, CA 90067. ●

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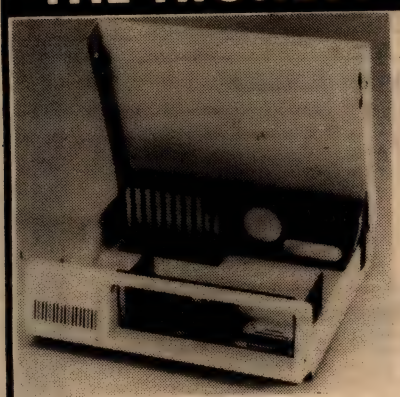

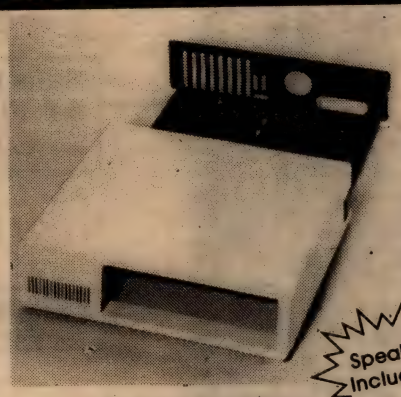

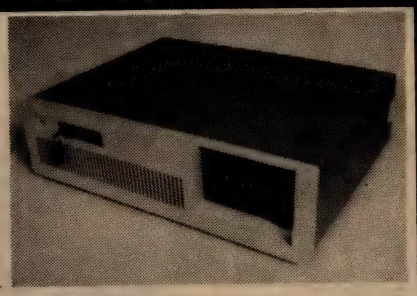

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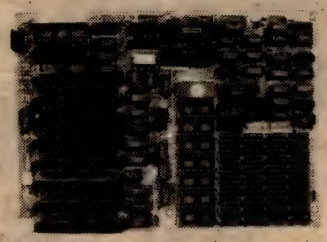

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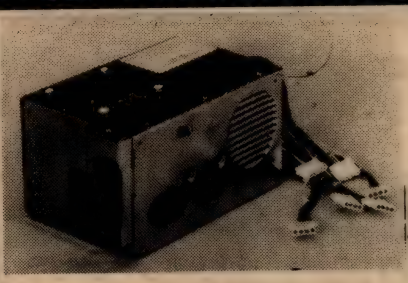

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Ask The Guru
continued from page 58

You might find Applesloth post processing a tad on the slow side. Even so, this may be the quickest and simplest way to get the effect you are after. Once you have what you want, things can almost always be made to run faster.

Let's briefly review the various ways we can speed up post processing, once you have exactly what you want. The entire Applesloth routine, or else just the time-critical parts of it, can be rewritten in machine language.

A less drastic solution is to eliminate the very slow, line-by-line disk access. One way to do this is to use the files as they sit in the word processor's workspace. Since Applewriter text files reside in auxiliary memory and are unaffected in a switch over to Applesloth, this can be easily done.

Several other ways to eliminate any line-by-line disk reads exist and may be suitable for other word processors as well. For instance, you can load the entire file at once into the machine and then do an internal search. Or, you can use a memory expansion card or a RAM disk to load the post-processed image. From RAM, the files can be rapidly read.

Here's an Applewriter post-processing tip: Do your final printing of the disk image by using "wide open" print constants. These include lm0, pm0, tm0, bm0, rm240, pi66, pl66, lj, and a blank ut. Remember that you want no further formatting added to your disk image. What is on the disk is what you want to print, except for your post processing add-ons.

Well, by now you get the general idea. If you want some special effect out of your word processor, just ask if a print to disk and some sneaky post processing cannot solve things for you. The chances are overwhelming that it can.

Tellyawhat. A free *SAMS* book to the best five uses of post-processing you send me. Any old word processor at all. Fair enough?

How Can I Print Black And White Photographs Or Other Video Images?

Naturally we'll start out with our stock answer. You do this with Applewriter on an Apple IIe. How else could you possibly process video images or print good grays?

Uh, better sit down for this one.

It looks like acceptable quality photographs and video images can be easily handled by Applewriter. By "acceptable" I mean something around 100 gray dots per inch, with nine to sixteen possible gray levels. Just like most of the halftone screens you see right here in *Computer Shopper*.

This all started when I first got my Laserwriter. I was extremely disappointed with how crude the grays looked. The stock grays were so putrid they actually looked as if they came out of a Macintosh.

Worse yet, any thin gray lines would disappear entirely every now and then, unless you used the painfully slow *setdash* operator. Such lines are essential for overprinting layout grids onto artwork to be digitized for laser printing. Gray lines are also nice on forms when you may want less contrast.

Recently, I checked into how the grays are imaged and came up with some surprising results. For some strange reason, the stock grays on Laserwriter are extremely crude, with the dots intentionally spread so far out that you get a "Sunday funnies" look.

I suspect that the reason for the lousy stock grays involves *purposely* degrading the Laserwriter output so it is compatible with the pitifully low resolution Quickdraw routines in the Mac.

Good thinking, kiddies.

Fortunately, it is quite easy to restore the grays back up to Apple IIe and Applewriter quality, resulting in a dramatic improvement in your images. In many cases, your grays will look almost as if they were painted on with an india ink wash.

Let's start at the start.

There is only one way to print a truly gray image on a sheet of paper. And that is to use gray ink. Should you want several different shades of true gray on the page, several passes through the press would be needed, each with an ink change to a new shade.

Since this is obviously ungood, the eye is instead tricked into looking at bunches of dots on the page that are so close together they appear as a gray image. Because you are exceeding the eye's angular resolution, the black and white areas become integrated together, and you end up thinking you are looking at gray, when there is actually no gray present.

With traditional printing, grays are converted to black and white dots by using a special mask called a *halftone screen*.

Halftone screens will produce a dot whose size depends on the gray scale at that point in the photo or video image. You might like to magnify some of the ads right here in *Computer Shopper* to see how the dots change shape and size as the areas lighten or darken.

Most halftone screens are rated in dots per inch. One popular traditional screen size is 120 DPI, which means there are 120 * 120 = 14,400 dots per square inch. Screens are usually twisted to a 45 degree angle, so that the dot structure is minimized. Other screen angles may be used in high quality work or for special effects.

The standard Laserwriter screen is a coarse 60 DPI, which explains why it looks so lousy. Because the Laserwriter resolution is 300 DPI in both directions, 60 DPI translates to a 5x5 square having a total of 25 dots. As figure one shows us, you can get 26 gray levels out

continued on page 117

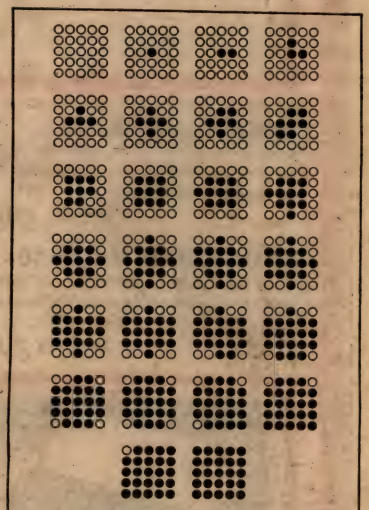

Figure One - Stock 60 line Laserwriter screen gives 26 grey levels but has a very grainy "sunday funnies" look.

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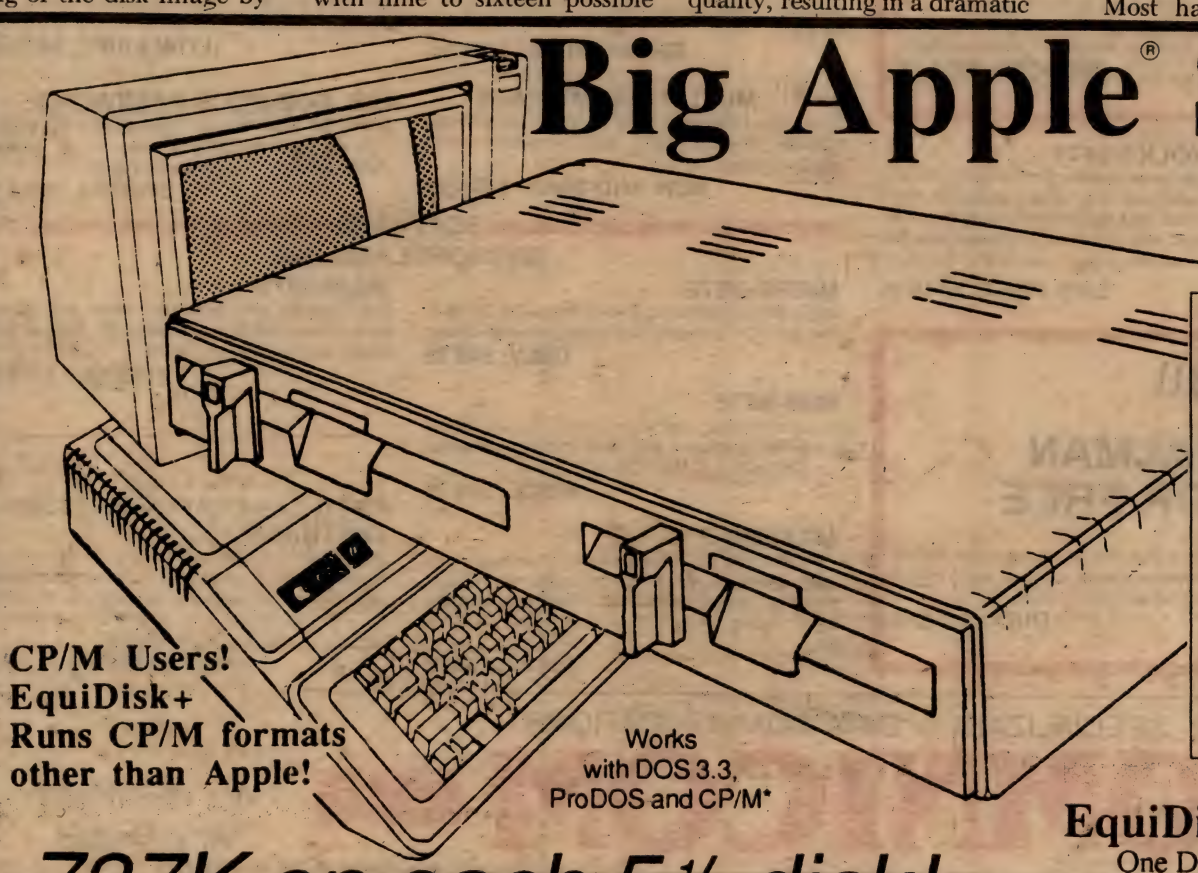

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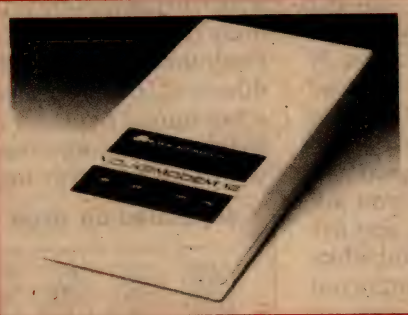

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This modem is an EXACT to the Hayes 1200 . . . PLUS . . . has storage ability for 10 numbers of 48 digits. Anchor Automation's "top-of-the-line" 300-1200 baud . . . for those who will only have a Hayes!

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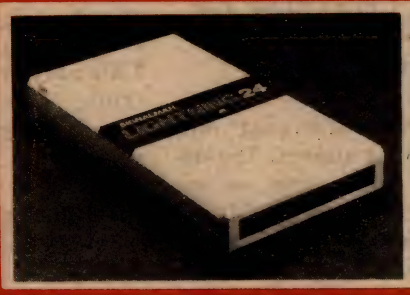

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300/1200/2400 baud Anchor Automation synch/asynch smartmodem wich truly combines "quality, innovation, and economy." Meets CCITT V.22, 212A, and 103 compatible standards. Enter the world of 2400 baud for this low price!!!

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An excellent 300-1200 baud Hayes-type smartmodem. Features sync/async communications and a 10 number memory. A great product!

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MULTI-TECH MT224AH

300-1200-2400 baud modem featuring v.22 compatibility. One of the best 2400 baud modems on the market!!

GREAT PRICE: $499.95

NEW!! MULTI-TECH MT224EH

Same 300-1200-2400 baud as above but features ERROR checking device which eliminates errors and line noise.

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This top-of-the-line modem meets the new 2400 baud CCITT V.22 standard and is asychronous/sychronous 2400/1200/300 bps with error checking.

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Ask The Guru
continued from page 115

of this screen by selectively printing or not printing each dot.

Which dot gets printed when it is set by a dot *spot function*? The stock spot function is 1 - (X*X + Y*Y), a math function that starts at the middle and works its way to the edge of the 5 x 5 array. Each X and Y value, as measured from the center spot is *dithered* slightly, so that as you get darker and darker, only one new dot is picked up at a time.

To visualize what is happening here, get yourself some long balsa strips that are a quarter inch square. Now cut the strips so the first is one inch long, the next an eighth inch longer, and so on until you have 25 strips.

Next, glue the strips together so they form a 5 x 5 array with one end flat and the other end tallest in the middle and forming a spiral to the edges.

Then, paint it black.

Next, find a ring that loosely fits the array. As you raise and lower that ring, note how more and more dots (balsa) are added to or removed from your spot function.

Things get a tad more complicated when you rotate the halftone screen to 45 degrees. It actually turns out that the stock 60 DPI, 45 degree screen has considerably less than 60 DPI resolution. The oblong array used has 32 dots and gives 33 gray levels. This only averages out to a 53 DPI screen equivalent.

There are restrictions on the size and rotation of the screen, since everything has to work out in integer arithmetic, modulo 300. Thus, while there are zillions of screen options you can call for, only a small handfull will end up unique.

Figure two shows us our first improved halftone. It is called a 100 DPI, 45 degree screen and gives you nine gray levels. The actual average resolution turns out to be 106 DPI. This is "four times grayer" than the stock tones, and sure looks better.

continued on page 121

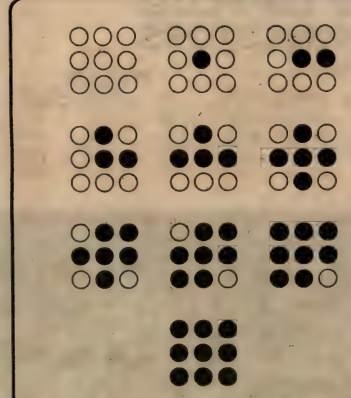
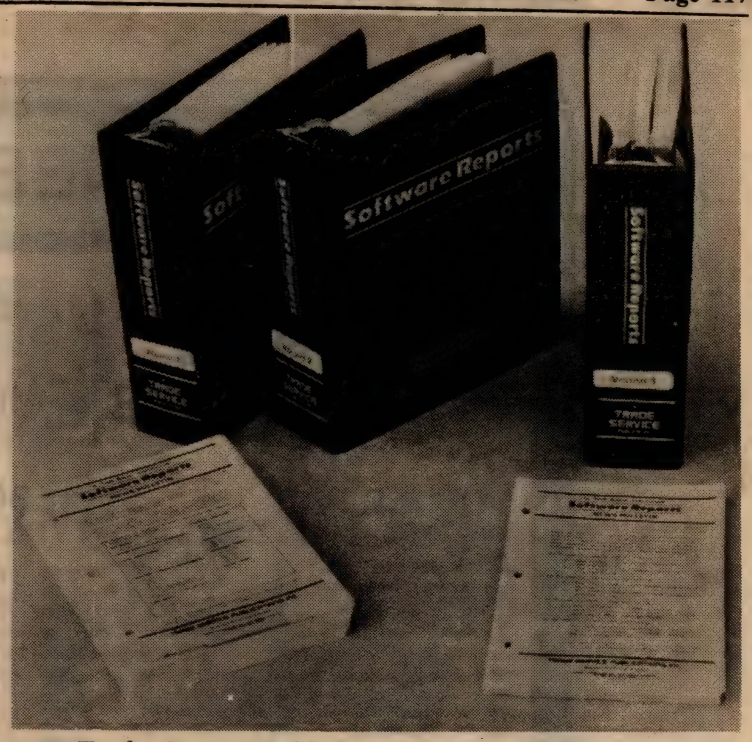


Figure Two - Custom 100 line Laserwriter screen only has 10 gray levels, but gives solid grays and video images.

Apple Software Leads Educational Market



Software available for Apple computers leads the educational market by a wide margin, according to recently compiled statistics from *Software Reports, The Guide To Evaluated Educational Software.*

While available educational software for IBM and Commodore computers has made dramatic increases in recent years, Apple programs still command an astounding 90% share.

Software Reports, which annually reviews hundreds of educational software programs for inclusion in its publication, covers software for the five most popular brands of computer hardware in schools: Apple, Atari, Commodore, IBM and Tandy TRS-80. Software is submitted voluntarily for review by publishers/distributors and *Software Reports* contains an excellent representation of what is available according to its Editor, Bonnie J. Dudley.

Statistics based on over 1,500 software programs submitted to *Software Reports* for evaluation show that 90% of that software is available for Apple Computers, 29% each for Commodore and IBM, 20% for Tandy's TRS-80 and 17% for Atari. (Note: Software is often available in more than one hardware version, resulting in over 100%).

When *Software Reports* began publication in July of 1983, Apple occupied 95% of nearly 400 submissions to the publication. IBM has shown the greatest increase, going from 7% in 1983 to its current 29%. Commodore climbed from 11% to 29%. TRS-80 and Atari have not changed notably with 21% versus current 20% and 18% versus 17% respectively.

Software Reports is multi-volume publication which features bi-weekly update issues for insertion in its ring-binder format. Each issue contains not only new reviews, but update information on previous reviews. Subscriptions are sold on an annual basis.

For further information contact Trade Service Publications, Inc., 10996 Toreyana Road, San Diego, CA 92121; (800) 854-1527 (includes Hawaii); in California (800) 542-6421.

Mention that you read about it in *Computer Shopper*. ●

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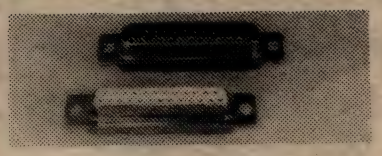
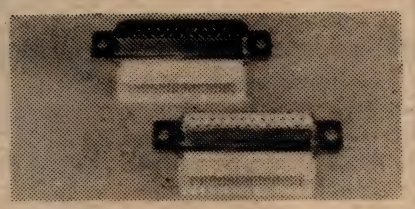
D—SERIES CONNECTORS



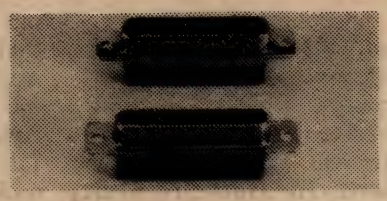
SOLDER POT

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
9P	9 pin male	0.84	0.76	0.70
9S	9 pin female	0.96	0.87	0.80
15P	15 pin male	0.96	0.87	0.80
15S	15 pin female	1.10	1.00	0.92
25P	25 pin male	1.10	1.00	0.92
25S	25 pin female	1.20	1.09	1.00
37P	37 pin male	1.64	1.49	1.37
37S	37 pin female	1.80	1.64	1.50
50P	50 pin male	2.62	2.38	2.18
50S	50 pin female	3.70	3.36	3.08



RIBBON CABLE TYPE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDC9P	9 pin male	2.35	2.17	2.01
IDC9S	9 pin female	2.53	2.34	2.17
IDC15P	15 pin male	3.10	2.86	2.66
IDC15S	15 pin female	3.25	3.00	2.79
IDC25P	25 pin male	3.73	3.45	3.20
IDC25S	25 pin female	4.28	3.95	3.67
IDC37P	37 pin male	4.75	4.38	4.07
IDC37S	37 pin female	5.63	5.20	14.83
IDC50P	50 pin male	12.98	11.98	11.13
IDC50S	50 pin female	14.47	13.35	12.40

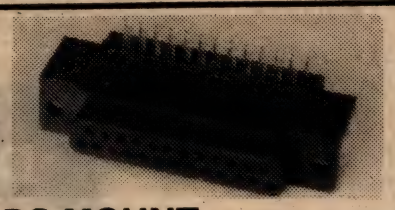


EMPTY CRIMP SHELLS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
C9P	9 pin male	0.70	0.62	0.56
C9S	9 pin female	0.70	0.62	0.56
C15P	15 pin male	0.73	0.64	0.58
C15S	15 pin female	0.73	0.64	0.58
C25P	25 pin male	0.75	0.67	0.60
C25S	25 pin female	0.75	0.67	0.60
C37P	37 pin male	0.96	0.87	0.80
C37S	37 pin female	1.00	0.91	0.83
C50P	50 pin male	1.12	1.02	0.93
C50S	50 pin female	1.14	1.04	0.95

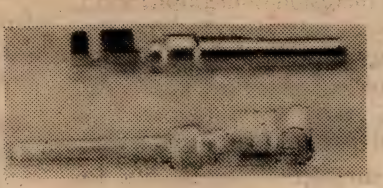
PC MOUNT STRAIGHT

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
P9P	9 pin male	0.90	0.82	0.75
P9S	9 pin female	1.38	1.25	1.15
P15P	15 pin male	1.12	1.02	0.93
P15S	15 pin female	1.98	1.80	1.65
P25P	25 pin male	1.56	1.42	1.30
P25S	25 pin female	3.06	2.78	2.55
P37P	37 pin male	2.14	1.95	1.78
P37S	37 pin female	4.36	3.96	3.63
P50P	50 pin male	2.74	2.49	2.28
P50S	50 pin female	5.68	5.16	4.73



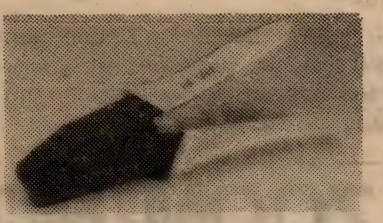
PC MOUNT RIGHT ANGLE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
R9P	9 pin male	1.60	1.45	1.33
R9S	9 pin female	1.62	1.47	1.35
R15P	15 pin male	1.52	1.38	1.27
R15S	15 pin female	1.54	1.40	1.28
R25P	25 pin male	1.96	1.78	1.63
R25S	25 pin female	1.98	1.80	1.65
R37P	37 pin male	2.94	2.67	2.45
R37S	37 pin female	2.98	2.71	2.48



CRIMP CONTACTS

PART #	DESCRIPTION	PRICE/QTY 1-99	100-999	1K-4999
CP20P	male contact	0.080	0.063	0.050
CP20S	female contact	0.100	0.068	0.054



CRIMPING TOOL

CT-1645	professional ratchet type	79.95

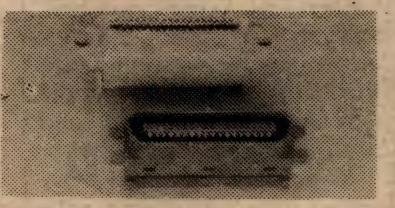
EXTRACTOR TOOL

EXT-1	removes crimp contacts	2.75

CENTRONICS SOLDER TYPE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
CEN-36P	36 pin male	3.00	2.67	2.40
CEN-36S	36 pin female	3.66	3.33	3.05

RIBBON CABLE CONNECTORS

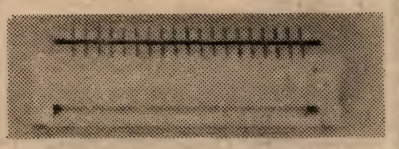


57 SERIES

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
ID57-24P	24 pin male	5.00	4.62	4.29
ID57-24S	24 pin female	5.50	5.08	4.71
ID57-36P	36 pin male	4.25	3.78	3.40
ID57-36S	36 pin female	5.50	5.00	4.58
ID57-50P	50 pin male	8.03	7.42	6.89
ID57-50S	50 pin female	7.52	6.94	6.44

IDS SOCKET CONNECTOR

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDS10	10 pin socket	0.94	0.85	0.78
IDS14	14 pin socket	1.00	0.91	0.83
IDS16	16 pin socket	1.12	1.02	0.93
IDS20	20 pin socket	1.18	1.07	0.98
IDS26	26 pin socket	1.50	1.36	1.25
IDS34	34 pin socket	1.78	1.62	1.48
IDS40	40 pin socket	1.98	1.80	1.65
IDS50	50 pin socket	2.32	2.11	1.93
IDS60	60 pin socket	2.70	2.45	2.25



IDE EDGECARD CONNECTOR

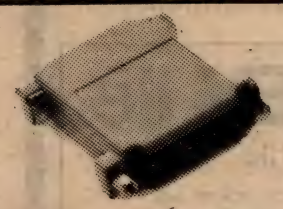
PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDE10	10 pin edg.crd.	1.30	1.16	1.04
IDE14	14 pin edg.crd.	1.55	1.38	1.24
IDE20	20 pin edg.crd.	1.75	1.56	1.40
IDE26	26 pin edg.crd.	2.13	1.89	1.70
IDE34	34 pin edg.crd.	2.50	2.22	2.00
IDE40	40 pin edg.crd.	2.88	2.56	2.30
IDE50	50 pin edg.crd.	3.50	3.11	2.80

IDD DIP PLUG CONNECTORS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
IDD14	14 pin dip plug	0.85	0.77	0.71
IDD16	16 pin dip plug	0.95	0.86	0.79
IDD24	24 pin dip plug	1.65	1.50	1.38
IDD40	40 pin dip plug	2.75	2.50	2.29

GREY HOODS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
GH9	9 pin hood	0.68	0.60	0.54
GH15	15 pin hood	0.80	0.71	0.64
GH25	25 pin hood	0.85	0.76	0.66
GH37	37 pin hood	1.06	0.96	0.88
GH50	50 pin hood	1.10	1.00	0.92



DUAL HOODS

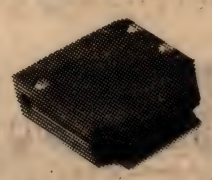
PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
DH25	25 pin hood	1.13	1.00	0.90
DH37	37 pin hood	1.17	1.04	0.94

SHIELDED HOODS

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
SH9	9 pin hood	0.80	0.71	0.64
SH15	15 pin hood	0.88	0.78	0.70
SH25	25 pin hood	1.00	0.89	0.80
SH37	37 pin hood	1.72	1.56	1.43

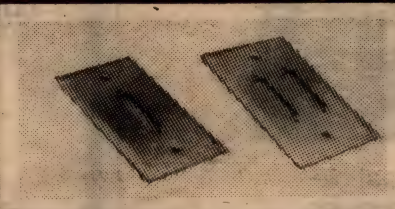
D-SERIES HARDWARE

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
MDH-1	male d-series hardware	0.55	0.35	0.25
FDH-1	female d-series hardware	0.75	0.65	0.55



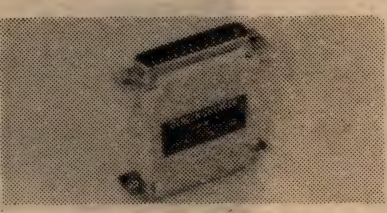
AMP HOOD

PART #	DESCRIPTION	PRICE/QTY 1-49	50-99	100-499
AH25	25 pin hood	1.25	1.00	0.83



RS-232 WALL PLATES

PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
WP-1	one slot	1.88	1.36	1.25
WP-2	two slot	2.13	1.55	1.42



RS-232 GENDER CHANGERS

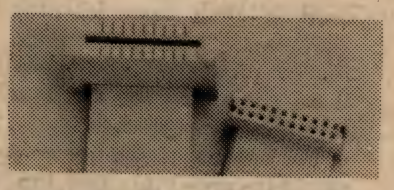
PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
AGC-M	male gender changer	7.95	7.27	6.67
AGC-F	female gender changer	7.95	7.27	6.67

ALTEX ELECTRONICS

RIBBON CABLE ASSEMBLIES

D-SERIES

PART #	DESCRIPTION	PRICE
9P-9P	9 pin male to male	5.64 + .18 per ft.
9P-9S	9 pin male to female	5.86 + .18 per ft.
9S-9S	9 pin female to female	6.08 + .18 per ft.
15P-15P	15 pin male to male	7.44 + .30 per ft.
15P-15S	15 pin male to female	7.62 + .30 per ft.
15S-15S	15 pin female to female	7.80 + .30 per ft.
25P-25P	25 pin male to male	8.96 + .50 per ft.
25P-25S	25 pin male to female	9.62 + .50 per ft.
25S-25S	25 pin female to female	10.28 + .50 per ft.
37P-37P	37 pin male to male	11.40 + .74 per ft.
37P-37S	37 pin male to female	12.46 + .74 per ft.
37S-37S	37 pin female to female	13.52 + .74 per ft.
50P-50P	50 pin male to male	25.96 + 1.00 per ft.
50P-50S	50 pin male to female	27.45 + 1.00 per ft.
50S-50S	50 pin female to female	28.94 + 1.00 per ft.

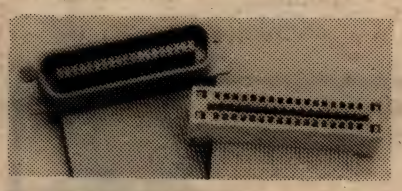


IDS SOCKET TO IDE EDGECARD

PART #	DESCRIPTION	PRICE
10S-10E	10 pin socket to edg.crd.	3.20 + .20 per ft.
14S-14E	14 pin socket to edg.crd.	3.50 + .28 per ft.
20S-20E	20 pin socket to edg.crd.	3.75 + .40 per ft.
26S-26E	26 pin socket to edg.crd.	4.75 + .52 per ft.
34S-34E	34 pin socket to edg.crd.	5.40 + .68 per ft.
40S-40E	40 pin socket to edg.crd.	6.45 + .80 per ft.
50S-50E	50 pin socket to edg.crd.	7.85 + 1.00 per ft.

IDD DIP PLUG TO IDD DIP PLUG

PART #	DESCRIPTION	PRICE
14D-14D	14 pin dip plug cable	2.60 + .20 per ft.
16D-16D	16 pin dip plug cable	2.75 + .32 per ft.
24D-24DE	24 pin dip plug cable	3.75 + .48 per ft.
40D-40D	40 pin dip plug cable	7.50 + .80 per ft.

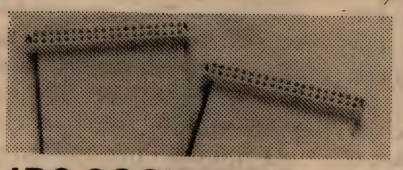


RADIO SHACK PARALLEL PRINTER CABLE

PART #	DESCRIPTION	PRICE
36P-34E	36 pin male to 34 pin edg.crd.	8.50+.68 per ft.

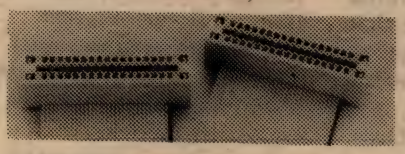
HARD DRIVE CABLE ASSEMBLIES

PART #	DESCRIPTION	1-9	10-24	25-49
HDC-22	22" hard drive cable assy.	8.50	7.73	7.08



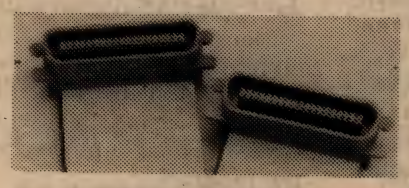
IDS SOCKET TO IDS SOCKET

PART #	DESCRIPTION	PRICE
10S-10S	10 pin socket to socket	2.00 + .20 per ft.
14S-14S	14 pin socket to socket	2.50 + .28 per ft.
16S-16S	16 pin socket to socket	2.75 + .32 per ft.
20S-20S	20 pin socket to socket	2.85 + .40 per ft.
26S-26S	26 pin socket to socket	3.50 + .52 per ft.
34S-34S	34 pin socket to socket	4.10 + .68 per ft.
40S-40S	40 pin socket to socket	4.50 + .80 per ft.
50S-50S	50 pin socket to socket	6.15 + 1.00 per ft.
60S-60S	60 pin socket to socket	6.65 + 1.20 per ft.



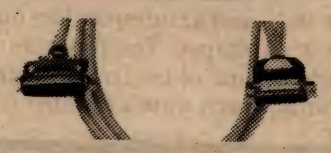
IDE EDGECARD TO IDE EDGECARD

PART #	DESCRIPTION	PRICE
10E-10E	10 pin edg.crd. to edg.crd.	3.80 + .20 per ft.
14E-14E	14 pin edg.crd. to edg.crd.	4.00 + .28 per ft.
20E-20E	20 pin edg.crd. to edg.crd.	4.50 + .40 per ft.
26E-26E	26 pin edg.crd. to edg.crd.	5.30 + .52 per ft.
34E-34E	34 pin edg.crd. to edg.crd.	5.90 + .68 per ft.
40E-40E	40 pin edg.crd. to edg.crd.	7.00 + .80 per ft.
50E-50E	50 pin edg.crd. to edg.crd.	8.50 + 1.00 per ft.



57 SERIES RIBBON CABLE ASSEMBLIES

PART #	DESCRIPTION	PRICE
5724P-P	24 pin male to male	10.00 + .48 per ft.
5724P-S	24 pin male to female	10.50 + .48 per ft.
5724S-S	24 pin female to female	11.00 + .48 per ft.
5736P-P	36 pin male to male	8.00 + .72 per ft.
5736P-S	36 pin male to female	10.00 + .72 per ft.
5736S-S	36 pin female to female	12.00 + .72 per ft.
5750P-P	50 pin male to male	16.75 + 1.00 per ft.
5750P-S	50 pin male to female	16.25 + 1.00 per ft.
5750S-S	50 pin female to female	15.75 + 1.00 per ft.



IBM CABLE ASSEMBLIES

PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
PPC301-6	6 ft. parallel printer cable	10.40	9.45	8.67
PPC301-10	10 ft. parallel printer cable	12.00	10.91	10.00
ATSC-10	10 ft. AT serial printer cable	19.90	18.09	16.58
MEC-10	10 ft. monitor extention cable	3.75	3.00	2.73
KEC-10	10 ft. keyboard extention cable	3.63	2.64	2.90

MISC. CABLE ASSEMBLIES

PART #	DESCRIPTION	PRICE/QTY 1-9	10-24	25-49
CC1	Atari cable, 13 pin male to female	11.88	9.50	8.64
CC2	Atari int. to parallel printer	13.13	10.50	9.55
CC4	5 pin din to 4 RCA plugs	3.60	2.88	2.62
CC8	6 pin din male to male	3.50	2.80	2.55
CC11	RGB monitor cable	9.13	7.30	6.64
JYA	joystick "Y" adapter	4.00	3.20	2.91

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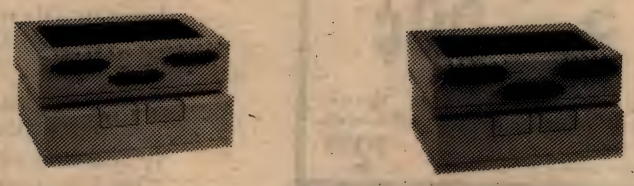
PART #	DESCRIPTION	PRICE
AB25-2	2 port serial	65.00
AB25-3	3 port serial	82.50
AB25-4	4 port serial	95.00
AB25-5	5 port serial	115.00
AB36-2	2 port parallel	92.50
AB36-3	3 port parallel	107.50
AB36-4	4 port parallel	120.00
AB36-5	5 port parallel	145.00
AB25-X	serial crossover switchbox	87.50
AB36-X	parallel crossover switchbox	117.50

ECONOMY PUSHBUTTON SWITCHBOXES



PART #	DESCRIPTION	PRICE
AB25P	2 port serial	44.00
AB36P	2 port parallel	54.00

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Review Of Elf Games

Elfware, a software company specializing in early learning software, is pleased to announce a unique sales approach which will benefit schools across the country.

We recognize that much of the software on the market is prohibitively expensive when used in school districts. It is our position that this is fostered by: 1) the concept of single-user licensing (one package, one machine); and 2) "copy protection" as a matter of routine.

They are presently selling their products to school districts on a site-licensing basis. What this means is that they do not sell packages to schools on a one machine-one package basis, they are on a one school-one package basis. There is unlimited copies of our product to be made and used by the participating district!

The advantage to the school district is significant. For example, Elf recently licensed a program "Elf Games I" to a medium sized district in Northern California. This district has 10 elementary schools and each of these schools have a learning lab with 10 Apple II computer networked to a Corvus hard disk. The district was considering the "Early Games" and "Stickybear" series of early learning software as well. The Elf program cost them $250.00 ($25.00 per school times 10 schools... no charge for Head Start or pre-schools) for the entire district whereas the other programs would have cost them between $3000 and $4000.

Presently three products: "Elf ABC"; "Elf Color Book" and "Elf Games I" are sold. These are all early learning programs and are oriented toward the K-2 range learner. Additional packages are being readied for release. "Elf Games II" is in Beta-test and a Dinosaur and an Adventure program are "in the works."

For further information contact Elfware, P.O. Box 118, Pollock Pines, CA 95726.

The parent of an early-learner wishing to introduce his or her child to the wonderful world of computers and learning has a multitude of choices. This article will review three exceptional buys in this portion of the educational software market.

Each program will be reviewed individually: there is a summary of the three at the end of the article.

Elf ABC

by B. Gayle Hanson

This program is intended for the child aged 2-5 years of age. The program begins with a Hi-Res screen of an elfin figure and a two-voice (yes, Martha the Apple CAN do two voices!) version of the "ABC song." The elf then politely waves a greeting to the learner. When the screen clears, the user can see instructions or proceed with the program.

The program is simple to use. For each letter keypress the child is rewarded with a delightful graphics image followed by a short selection of classical music (also in two voices!) Numbers are also supported by this program. For each number keypress the child sees a corresponding number of shapes. The program displays one of twelve different shapes each time a number is chosen. The number segment plays the same twenty-plus music pieces as well.

Error trapping is excellent and inappropriate keypresses are ignored. There is a reset trap in the program so that the novice user cannot "fall out" of the program into basic or the monitor.

These are excellent products. My resident testers are quite taken with these programs. My children prefer these programs to most of the better known (and substantially more expensive) programs. The programs are very easy to use and have quality graphics. The music in these programs is in a class by itself when compared to that used in other early learning programs. If you are in the market for early learning software these may be the best buys around right now.

For further information contact Eflware, P.O. Box 118, Pollock Pines, CA 95726. Price $17.50; Copy protected? No; Replacement Policy: $5.00 with return of defective diskette after 30 days; System requirements: Apple II systems with 48K and disk drive, DOS 3.3, (color TV or monitor suggested); Documentation: single sheet/on disk.

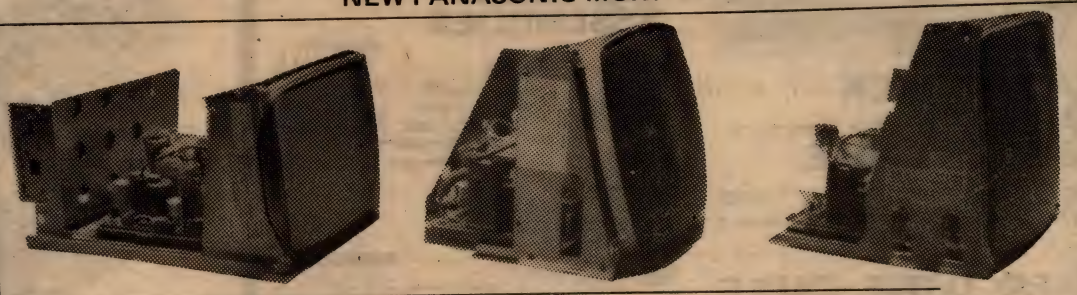
Software Review

by Patrick McCormick
Computer Lab Instructor
Sacramento, CA
and
William Brooks
Elementary Teacher
Elk Grove, CA

As a new entry into the software arena for preschool age children, ELF ABC brings fun

continued on page 124

NEW PANASONIC MONITORS



We have just received a large quantity of unused Panasonic Monitors, 9", 12", and 15" sizes. All have a non-glare high resolution green phosphor CRT by Matsushita. Power supplies are light weight switchers. Input is TTL levels, with separate vertical, horizontal and intensity inputs. In a typical application; the display format is 2000 characters, 80 columns by 25 lines, vertical scanning frequency is 50hz, horizontal scanning frequency is 18.432 Khz, characters are 9x14 block with a 7x9 dot matrix. video bandwith 16.257Mhz. All at an unbelievable price of $59.95 ea. plus shipping

THIS MONTH'S SPECIALS
Tektronix 4012 graphics terminal, unused. . . . $600.00
Intelligent Systems 40011 color terminal. . . . $575.00
Hewlet Packard 7475 Plotter, unused . . . $1200.00
Racal–Vadic VA3451 modem . . . $275.00
Datacube video–ram board, Multibus . . . $50.00
Teletype model 43 KSR . . . $225.00
Heath H19 terminal. . . . $175.00
Mitsubishi 19" industrial grade hi–res color monitor, RM. . . . $550.00

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AppleTalk Developers Association Formed At Comdex

The AppleTalk Developers Association (ATDA) announced its formation at Fall Comdex recently. ATDA is a trade association representing firms marketing or developing products that work with Apple Computer's AppleTalk local area network. ADTA is dedicated to increasing the usefulness, productivity, and market penetration of AppleTalk.

ATDA held its first meeting and selection of officers at Comdex, electing Guy Andre Mariande as President. He is currently Vice President of Tangent Technologies Ltd., developers of PC MacBridge (the PC to AppleTalk interface card).

ATDA brings together firms developing a myriad of AppleTalk products, such as file servers, printers, disk servers, electronic mail systems, multiuser software, PC to Macintosh conversion software, and other such products for Macintosh, IBM PC and Unix devices.

"In less than a year, AppleTalk has become one of the leading local area networking products and represents a unique communications solution for work groups. The formation of ATDA illustrates the industry's commitment to the AppleTalk standard and will be a positive force in providing a greater variety of solutions for the marketplace," said Peter Friedman, manager of Apple Computer's Business Information Marketing.

Firms initally joining ATDA are Adobe Systems, Allied Linotype, Austor MicroSystems (Australia), Bear River Associates, Dataviz, D-K Research, Forethought, Infosphere, Legalware (Canada), Lutzky Baird, McKenzie Brown (Canada), MICAH, Micro-Design, Plandata Software AB (Sweden), Prime Computer, SpectraFAX Corporation, Tangent Technologies, Tri-Data, and Videx.

ATDA is setting up committees to ensure hardware and software compatibility, to enroll other companies as members, and to develop long range plans for the association. Members may also participate in co-marketing and joint development of new products.

According to Egil Juliussen of Future Computing, over 5000 AppleTalk nodes are sold per month, making it one of the two best selling local area networks. With over 100 companies offering or developing AppleTalk-compatible products, AppleTalk has become a major standard for local area networking at the work-group level.

AppleTalk interface devices allow users of Macintoshes, IBM PCs Unix systems, and other networks to connect to the AppleTalk network easily and at a low cost, to add devices without complicated reconfiguration, and to cost-effectively share the Apple LaserWriter, Linotype laser imagesetter, and other devices.

For further information on ADTA, contact Tangent Technologies Ltd., 5720 Peachtree Parkway, Norcross, GA 30092; (404) 662-0366 or (404) 496-1303.

Mention that you read about it in *Computer Shopper*. ●

Ask The Guru
continued from page 117

This particular screen would seem to be an excellent choice for printing photographs and video images. You would do this by digitizing an image so that there are around 100 gray dots per inch in both directions.

Then you would reduce the resolution of the digitized gray image to exactly nine levels.

The digitized levels are then converted to hex-ASCII pairs and grabbed by Applewriter as part of your textfile. From there, the image command in Postscript takes over and draws the picture.

You could trade off gray levels for screen resolution. The more grays, the farther apart the gray dots have to be placed.

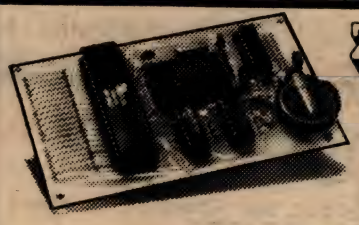
With stock Applewriter, you could handle a tad under five square inches of picture in one piece. This can be dramatically increased by going to suitable compaction schemes or else by using a RAM card for textfile expansion.

I don't happen to have any digitized video or photos on hand, but if you send me some on disk, I'll be happy to play with them for you. Between tinaja quests, of course.

At 106 DPI, these dots are barely discernable.

For line artwork, you might prefer even denser dots and fewer gray levels. My favorite screen is a 133 DPI, 28 degree one that gives you six gray levels. As you can see from figure three, the dots are so close together that the grays look as if they were an ink wash. Yet they still remain

continued on page 122



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Ask The Guru
continued from page 121

readable as a halftone by most printing processes.

Actually, that's what I *hope* you will see. I have no control at all over the actual *Computer Shopper* printing machinery, so this figure may end up a total disaster by the time you look at it.

Nothing ventured, nothing lost. Oh well.

Figure four shows the Postscript commands needed to set these special screens. You can also design custom screens with b ackground patterns or anything else you want. Details on pattern screens appear in the two Postscript books.

We can now see from figures one or two exactly why certain grays drop out on one-pixel lines. There is a minimum amount of "grayness" needed in the spot function to be sure that all horizontal and all vertical single pixel lines encounter at least one black dot in the halftone.

So if your gray lines occasionally drop out, either switch to a denser screen or else change to a darker gray.

So far, I have been unable to find any dense halftone screens having 7, 8, or 16 gray levels.

Please let me know if you find any.

There is one restriction to use on very dense screens. The lightest available gray ends up fairly dark. This is caused first by the limited number of dots and secondly by the fact that each dot "overprints" somewhat so that the toner dot ends up larger than its intended size. If this did not happen, solid lines and blacks might not be continuous.

Thus, a halftone function with half of the dots printed and half of the dots blank will appear considerably darker than a 50% gray.

You are free to mix halftone screens any way you like. Thus, you can use your 133 line screen for medium and dark grays and the 100 line one where you absolutely must to have something lighter.

To find out what great Laserwriter grays really look like (without having a humongous printing press running interference), just write or call, and I will gladly send you a free gray scale demo that you simply will not believe.

Be sure to remind me that this is the special gray demo pack. Both of which you are certainly welcome to.

All done on an Apple IIe, of course. •

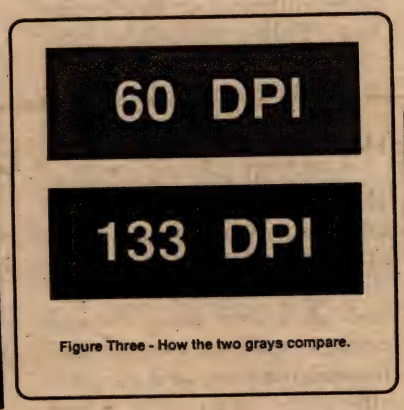

Figure Three - How the two grays compare.

```
BEST GRAYS:
133 28 {dup mul exch dup mul add 1.0 exch sub} setscreen

BEST VIDEO:
100 45 {dup mul exch dup mul add 1.0 exch sub} setscreen

DEFAULT:
60 45 {dup mul exch dup mul add 1.0 exch sub} setscreen
```

Figure Four - Postscript halftone screen commands.

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UniDOS 3.3 is available for $49.95 postpaid from MicroSPARC Inc., 45 Winthrop St., Concord, MA 01742; (617) 371-1660.

Mention that you read about it in *Computer Shopper*. ●

Review of Elf Games continued from page 120

and learning together in a program that will amuse both young and old. The program includes an alphabet and number game for youngsters that has captivating pictures and music and is such fun that the children will seldom be playing it alone.

Similar in style to several other programs, ELF ABC can not be said to be totally unique in its content. There are, however, several things that set this program apart from its competitors, including entertaining graphics, high quality music (created with the MUSIC DUET program written by Paul Lutus), and a quality-to-price ratio that is seldom seen in today's market.

Upon loading the program, a colorful ELF logo soon appears and familiar music begins to play (the ABC song that we all learned as children), announcing that the fun is about to start. Next, the user is given the option to read the instructions or go right to the game. In the instructions (which are written for adults or older children), the user is told how to use the program and also how to turn off the music, if it is desired. This option is quite convenient, for children seem to have far more tolerance for listening to the same music over again than do their parents!

The game itself is quite easy to play: one simply presses any alphabetical or numerical key, and in a flash, a picture is shown on the screen and music begins to play. The alphabetical keys usually cause a creature, whose name begins with the letter that was pressed, to appear. These creatures are sometimes real, other times fanciful, but always quite amusing and well drawn.

The real animals that are used are not the usual variety, but animals that the children will enjoy being introduced to. Of course, at first, the children will need someone to introduce them to these new friends. After a short time, the children will be introducing the animals to their own friends and, at the same time, learning the alphabet.

A press on a numerical key causes an animated picture to be shown. This picture shows a number of similar objects, the same as the number pressed, flashing in different colors. These objects can help the child associate the number presed with the same number of objects that can be counted: an important lesson for the young child.

After being introduced to the program the first time, the child will need little help in using it, as its use is trouble-free and have been taken care of. This fact should not stop parents from enjoying the program with their children, however. Parent and child make a great learning team, and with ELF ABC what could be more fun than enjoying your child's learning?

Elf Coloring Book
by B. Gayle Hanson

The purpose of this program is allegedly to develop hand-eye coordination but anything this much fun just can't be educational! The program is intended for children aged 4-6 years of age but is appropriate for children of all ages.

continued on page 125

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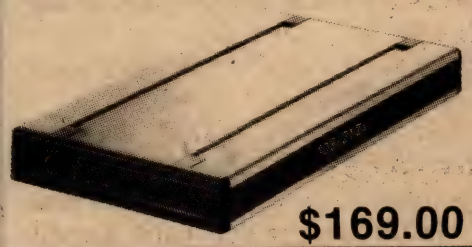

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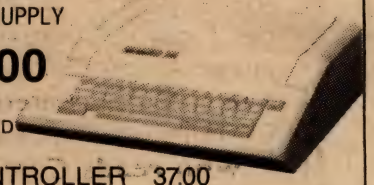

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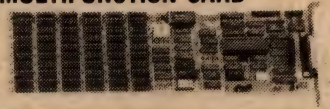

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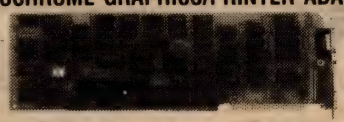

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Review of Elf continued from page 124

There are two versions of the program on the disk-one for joysticks and one for the keyboard. The first screen allows one to select joystick or keyboard. This is followed by a Hi-Res screen of an elf. On the screen one sees a small crosshairs. The crosshairs are moved about with either the joystick or the keyboard using the IJKM diamond. One simply movies the + to the area to be colored and presses the fire button. To choose from one of twelve colors the user moves to the bottom of the screen and a "palette" appears. Returning to the picture is equally simple. To use the utilities one moves to a square marked with a picture of a diskette. From here the user can choose a new picture to color, save a colored picture, initialize a new disk, etc. One or two disk drive systems are supported.

For more information contact Elfware, P.O. Box 118, Pollock Pines, CA 95726. Priced at $17.50; Copy protected? No; Replacement policy: as above; System Requirements: Apple II systems with 48K and disk drive, Color TV/Monitor required, joystick suggested; Documentation: two pages/on disk.

Elf Games I

This programs is intended for the child aged 4-6 (K-1). The program begins with a Hi-Res screen of the now-familiar elf and a two-voice version of "The Entertainer." The elf then waves at learner. When the screen clears the user can turn the sound on or off. After the sound is dealt with the user is then presented with a Hi-Res menu from which one may select one of eight learning activities ("icons" are included for the non-reader).

The program is simple to use and any section of the program may be left by pressing 'esc'. The following skills are covered in the program: letter recognition, number recognition, adding, subtracting, counting, and shape recognition. After each correct answer the child is rewarded with musical tones and a message. When the child has gotten five answers right there is an animated display and a short bit of music.

For further information contact Elfware, PO Box 118, Pollock, Pines CA 95726. Price is $17.50; Copy protected? No; Replacement policy: $5.00 with return of defective diskette after 30 days; System Requirements: Apple II systems with 64K and disk drive (color monitor or/TV suggested); Documentation: single sheet/on disk. ●

Macintosh at Comdex continued from page 59

line of equipment. Suggested retail is $89.00.

Two different manufacturers, Haba and DataSpace, were showing 800K floppy disc drives. The Haba unit, called the Habadisk 800, is a dual sided unit that has a manual disk eject button. The unit is available for either external or internal use. Suggested retail price is $599 and the product is available now. The DataSpace unit is called th DS800 and is manufactured by the DataSpace Corporation, A Canadian company. It too is a dual sided unit with a manual disk eject button. According to a sales representative, DataSpace makes all third party Apple Macintosh external disk drives sold in Canada and just started exporting to the United States. The unit is available now and has a suggested retail price of $549.

A variation on the external disk drive was shown by Western Automation which has DASCH (Disk Acceleration/Storage Control Hardware). Dasch is an external ram disk unit that connects to the Macintosh via either the printer or modem port. According to Western Automation, the unit works almost seven times as fast as a disk drive. And unlike software based ram disk, no memory is taken from the Macintosh and a system crash will not delete information sorted on the DASCH unit. DASCH units

continued on page 132

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Computer Smyth's primary interest is hands-on construction, modification and expansion of micros. We see the IBM PC phenomenon as a giant magnet or vacuum, dragging hardware and software talent into a vortex of activity that ignores and overshadows the line of new CPUs and peripheral hardware enhancements that are becoming available. We believe 32-bit architecture is the proper and exciting growth direction for micros and too little talent is being invested in that opportunity.

Computer Smyth's editors are also determined to cover all opportunities including the rich offerings of the IBM lines as they appear and especially to evaluate the so-called clones.

We believe magazines are hard-copy networks—or extensions of the central nervous systems of those who read them and interact with each other through them. The inter-stimulus factor accelerates each participant's learning curve, produces new combinations of ideas and new answers, and defines fresh problems. We are content and idea centered—not just a sales medium for consumer goods.

Who reads *Computer Smyth?* We're looking for the intelligent, technically curious and adventurous computer buff who isn't afraid to take the back off the case, who likes new experiences and digs into any device, unsatisfied until all its mystery is dispelled and its potential is fully in hand. Our reader is a craftsman who enjoys building, even while finding the adventure just a little scary.

Our first-year line-up included: The SC84 computer; a brand new Z80 system with exceptionally powerful peripheral possibilities and a plain English description of each and every capability of the machine and its operating system; an X/Y charter/plotter you can build for under $60 that will teach you a lot about how these devices work; a neat, powered wire-wrap tool for two hours of your time and a little more than the price of the tool's bit; an RGB color to composite converter board; Ed Scott's three part series on his 68000 computer; Ken Barbier on printer interfaces; a multipen plotter upgrade; a Data Destroyer (for super clean disks) a review of the DTC XT clone; an RMN converter; and an audio module for the Atari 8000.

Coming up in 1986: a switched power supply; an EPROM programmer; a safe, active circuit tracing tool; a silicon disk; how to identify and find microchips; how to buy a superplus keyboard; and builder reports on four single-board computers: Z80, 64B180, PC and XT.

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MacUniverse
continued from page 59

it runs the risk that I will pan it. As a matter of fairness, if a product just does not work or just has major defects, I call the company and discuss the problem with it. It may be my unit is defective or I misread the instructions. After I am done with most products they either go back to the manufacturer or get thrown into storage.

Editor's Note: When I do no agree with L.J., I put in my two cents worth, but I do not change his opinions.

Laserwriter Update

Recently Apple dropped the suggested retail price of its Laserwriter by $1000 to $5995. Before you rush out and buy one at that "new low" price, realize you will be overpaying. If you live near a major city with a number of Apple dealers, a Laserwriter should cost approximately $4600. You ask how can this be. Well let me tell you a short story. Last October, I made the rounds of the major Apple dealers in St. Louis and asked the following question: "What is your best price for a Laserwriter?" When they relied $6995, I lied (shame on me) and said "Well (the name of another dealer) is asking $5700. Why should I pay more?" Inevitably each agreed to beat the price. I finally bought one for $5600. And where did I buy my Laserwriter. It wasn't from some fly-by-night Apple dealer who might disappear tomorrow, but from the computer department of May Department Stores. This is a large department store chain whose stock is listed on the New York Stock Exchange. So if I paid $5600 three months ago and Apple has just dropped the price $1000, the actual selling price should drop accordingly. The actual price you pay will depend on the amount of the competition in your town and your ability to bargain.

Laserwriter Toner Cartridges

Since I now own a Laserwriter I have to buy toner cartridges. At $90 apiece, they are not cheap. It took me two cartridges before I realized that Apple is *slightly* mistaken about the number of copies that can be printed per cartridge. According to Apple, each cartridge should be replaced after approximately 3000 copies when the cartridge indicator turns all red. As a test I kept a cartridge in until the print started to fade. I am getting almost 6000 copies per cartridge primarily printing straight text without graphics.

Tax Time

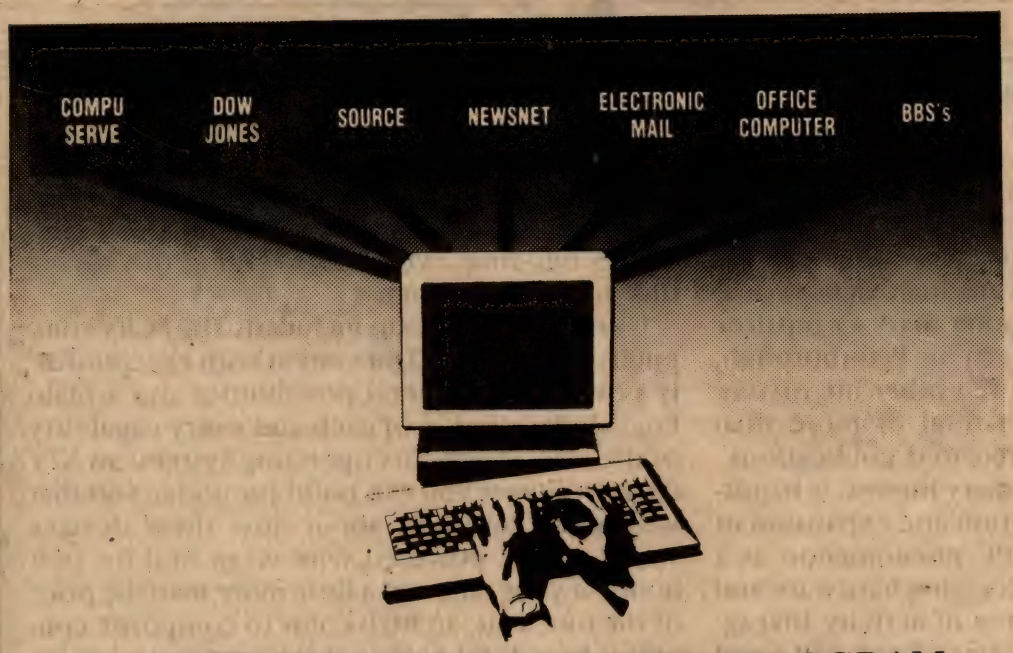
For those of you who have trouble preparing your own Federal income tax forms take a look at MacInTax. This is a sophisticated income tax preparation program that displays the exact IRS form on the screen. With MacInTax the entire IRS booklet is stored in the program on a line-by-line basis. Simply double click on the text of any line and an instruction window containing the complete IRS instructions for that line appears. Furthermore all totals and taxes are computed and displayed after every entry and all forms and schedules are automatically linked.

MacInTax comes in three formats: MacInTax Federal, MacInTax Business Supplement, and MacInTax State Supplements. The main program is MacInTax Federal and is required for the supplements to work. It contains the following individual tax return forms:

1. Form 1040EZ--the very short return;
2. Form 1040A--the regular short form;
3. Form 1040--the long form;
4. Schedule A--Itemized deductions;
5. Schedule B--Interest and Dividend Income;
6. Schedule D--Capital Gains and Losses;
7. Schedule E--Supplemental Income Schedule;
8. Schedule G--Income Averaging;
9. Schedule R--Credit for the Elderly
10. Schedule W--Deduction for a Married Couple When Both Work;
11. Form 2119--Sale or Exchange of Principal Residence;
12. Form 2441--Credit for Child and Dependent Care Expenses;

continued on page 129

INTELLICOM



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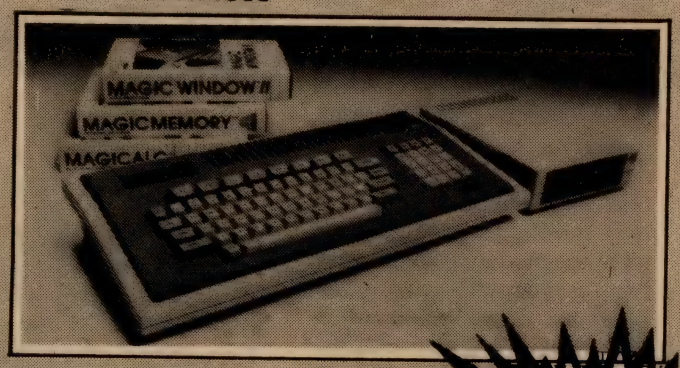

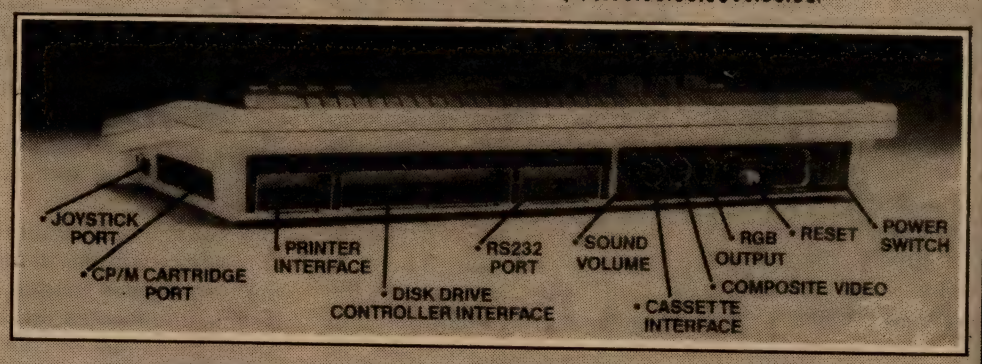

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MidPro 3000 SPECIFICATIONS

MidPro 3000™ is a complete, self-contained computer based on the popular 6502A microprocessor and can tap into the tremendous software library of Apple®II. Standard features include192K Bytes RAM, 32KB Enhanced Microsoft® BASIC, 80 column text, 560H X 192V color graphic display, 81-key sculptured keyboard and high efficiency switching power suply. Also included as standard are Centronics® bus printer interface. Cassette interface and 4-channel sound generator.

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- 6502A Central Processor running at 2 MHZ or 1 MHz.
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Memory
- 192k Bytes User RAM standard.
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- 40 columns x 24 rows or 80 columns x 24 rows software selectab.e
- 5 x 7 characters in 7 x 8 matrix.
- Upper and lower case characters.
- One of Eight colors for characters/graphics and background – Red, Green, Blue, Cyan, Magenta, Yellow, Black and White.
- Character set with normal, inverse and flashing capabilities.

• GRAPHICS
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- 280H x 192V 8 colors bit image – Black White, Red, Green, Blue, Cyan, Magenta, Yellow.
- 560H x 192V 6 colors – Black, White, Violet, Green, Blue, Orange, (High resolution color monitor required)
- All graphic modes software selectable.

I/O

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- 81-key sculptured typewriter keyboard
- Numeric keypad.
- 8 user-defined function keys.
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• Video Output
- Color composite video output.
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• Sound Output
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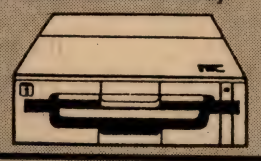

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MacBottom Review

by L.J. Kutten

The MacBottom hard disk by Personal Computer Peripherals is a second generation unit designed specifically for the Macintosh. At a suggested retail price of $1595, it offers ten megabytes of storage (approximately 21.5 floppy diskettes). And unlike many hard disks currently on the market, the MacBottom will work on a 128K Macintosh and a serial port is not lost.

The MacBottom's primary advantages are (1) speed and (2) the ability to manipulate large files. In the speed category, MacBottom is roughly 2 1/2 times faster than a floppy. For example, MacPaint on a floppy takes 25 seconds to open a file but only ten seconds on the MacBottom. The ability to handle large files is very useful when working with databases and word processing documents. For example, a 256K Microsoft Word floppy file cannot be closed on the disk from which it was opened. It must be saved on another disk. This entails a large amount of disk swapping. With MacBottom, this problem does not exist.

Ease of Set Up

The MacBottom is easy to set up and operate. Set up requires (1) connecting the power cord; (2) connecting the MacBottom to Macintosh; and (3) configuring the start up disk. The connection to the Macintosh is attaching the nine pin plug from the MacBottom to either the modem or printer port. Configuration involves running the start up disk and telling MacBottom what port it is attached to and what volumes to automatically log onto the desktop at start up. Total time from unpacking to using an application program can take less than five minutes. The only caveat with setting up the MacBottom is that the unit must physically go under the Macintosh. Its cable is too short to place it anywhere else.

The MacBottom will work with either the modem or printer port. Most users will use the printer port and connect the Imagewriter printer to the MacBottom. However if a Laserwriter is used, the MacBottom must be connected to the modem port as the Laser Writer requires the printer port.

Using MacBottom

MacBottom works on "volumes." To the user these are identical floppies except they can be much bigger. Volume size ranges from 400K to 10 megabytes. The maximum number of volumes is 25. The start up disk controls what volumes automatically appear on the desktop at start up. After start up additional volumes are added by using the desk accessory "Insert Volume." A volume is deleted by dragging it to the trash can. Only six volumes can be on the desktop at any one time along with the internal and external floppies.

A volume can be increased at any time without damaging the files on it so long as there is some unallocated space left. A volume cannot be decreased in size without destroying the files on the volume.

Print Spooling

Print Spooling is automatically supported by the MacBottom provided (1) some area on the unit is not allocated to any volume and (2) the Imagewriter is used. Print spooling does not work with the Laserwriter.

In the event spooled printing needs to be stopped, the manufacturers have provided a desk accessory entitled, "Flush Print Buffer." This desk accessory empties the print buffer.

Software Compatibility

According to the manufacturer the only program totally incompatible with MacBottom is Slide Show Magician.

Another slight incompatibility is running communication programs such as InTouch, Mite, and RedRyder when the modem is attached to the Macintosh's printer port and MacBottom is attached to the modem port. There is an incompatibility in the serial drivers and the programs crash spectacularly. This problem does not exist when MacBottom is attached to the printer port and the modem is attached to the modem port. The only users who will face this problem are LaserWriter users. One solution is to use a McNifty Switch or similar device; attach both the MacBottom and the modem to the switch. When communicating, switch off MacBottom.

A different problem is faced when attempting to run copy-protected software to work on the MacBottom without inserting a key disk. Unless a hard disk copier such as Copy II Mac, Version 4.2 or higher is used, a key disk will have to be installed each time the copy protected program is run.

Backup Program

Because the MacBottom can store vast amounts of data, the manufacturer has prepared two special programs to facilitate making backup copies of files. Available parameters include backing up modified files only, backing up an entire volume or backing up selected files. Additionally the normal Macintosh interface of copying files by selection and dragging works.

Bugs

The MacBottom is rather stable. In two months of operation, only two bugs of any significance appeared. First, MacBottom occasionally locks up when working with large Microsoft Word documents. The only way to unlock it was to reboot the Macintosh. This runs the risk of destroying the document being worked on. This bug was caused because the MacBottom operates with a "locked" finder. That is, the system disk on MacBottom is the master disk and will be used regardless of any other system file on MacBottom. I was able to eliminate this bug by unlocking the finder

continued on page 130

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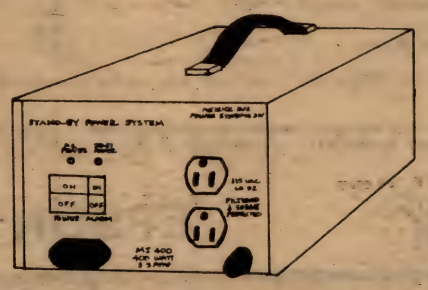

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Dealers Welcome

MacUniverse
continued from page 126

13. Form 3903--Moving Expenses;
14. Form 5695--Energy Credits; and
15. Form 6252--Computation of Installment Sales Income

MaxInTax Business supplement contains forms self-employed individuals will need. They are:

1. Schedule C--Profit or Loss From Business of Profession;
2. Schedule F--Farm Income and Expenses
3. Schedule SE--Computation of Social Security Self-Employment Tax
4. Form 2106--Employee Business Expense;
5. Form 2210--Underpayment of Estimated Tax by Individuals
6. Form 3468--Computation of Investment Credit;
7. Form 4562--Depreciation;
8. Form 4797--Supplemental Schedule of Gains and Losses; and
9. Form 6251--Alternative Minimum Tax Computation.

The MacInTax State Supplements is only available for California. The publisher hopes to have New York available by February.

Because of the Macintosh's high graphic capabilities, MacInTax is the only program which has received formal IRS approval for a dot matrix printout of the signature form (Form 1040). With a Laserwriter it is virtually impossible to tell the MacInTax reproduction from the real form.

MacInTax is published by Softview I, Ltd. MacInTax Federal cost $75 and each supplement costs $30. Yearly updates are planned at an annual cost of $30 for the Federal and $15 for the Supplements.

Typographer

It seems that no matter how hard I try, software companies change their products on me. Last month I mentioned that Microsoft was releasing a program called Typographer which would allow desktop publishing. No sooner did I finish that column and mail it in than Microsoft cancelled this product. No one at Microsoft will say why the program was cancelled but scuttlebut has it that Bill Gates, Microsoft's president, personally ordered the product killed because it was not user friendly enough.

Educational Software

If you have children and are

continued on page 133

Microsoft MacEnhancer
continued from page 60

The scaling software works with the MacEnhancer's printer-driver software. With the MacEnhancer, users can take advantage of graphics capability of all the following printers:

*Apple ImageWriter
*C. Itoh ProWriter™ 8510™
*Epson FX-80™
*Epson FX-100™
*Epson LQ-1500™
*Epson MX-80™
*Epson MS-100™
*Hewlett-Packard ThinkJet
*IBM Graphics
*Okidata Microline 92
*Okidata Microline 93
*Toshiba P1340
*Toshiba (1351)

The MacEnhancer also includes terminal-emulation software, MacEnhancer terminal, that provides Macintosh owners with access to dial-up databases, such as Dow Jones News/Retrieval® , CompuServe® , and The Source (SM). In addition, this software allows Macintosh owners to access a variety of mainframe computers, as well as minicomputers and microcomputers.

Updates Planned for Owners Plus Dealers and Distributors

Microsoft plans to ship free software updates to all registered customers. In addition, Microsoft plans to provide software updates for all current dealer and distributor inventory.

"Microsoft is commited to supporting our customers as well as our retail channel," said Bill Roland, Vice President of Microsoft's Hardware Division, "This free upgrade is a good indication of just how strong that commitment is."

Microsoft MacEnhancer requires either 128K or 512K Apple Macintosh with one disk drive and retails for $249.

Microsoft Corporation manufactures and sells a wide range of software operating systems, languages, application programs, books, and hardware for the microcomputer marketplace.

For more information contact: Microsoft - (206) 828-7400 or The Waggener Group - (503) 245-0905.

Mention that you read about it in *Computer Shopper* ●

Patchnet And Patch BBS Going Live

When we announced that *Computer Shopper* subscribers would be able to sign up with Delphi without membership charges, we also announced that we would have our own area on the network. We regret that we have not implemented this area because we have had technical problems involving access telephone lines that have not been solved. We now have hopes of resolving this problem

We are also in the process of installing a direct Patch BBS for those who do not care to contact us through a commercial service. The details of Patch BBS will also be announced in the next issue. The Patch BBS will run on an IBM PC with a 20Mbyte hard disk and we would appreciate suggestions on the best BBS software to run. Right now we are looking at the FIDO Net BBS Software, but we are open to your suggestions. Please drop a line to Stan Veit, Editor, if you have opinions on this. Thanks for your help.

While I am asking for your help, I would like to mention another problem that has surfaced recently. People are writing in to drop a BBS from listing in *Computer Shopper* and that is fine, the problem is that it is not their BBS at all and the SYSOP knows nothing about it until the next issue when the board is no longer listed. This is the work of the same Nerds who "Bust Boards" and I would like to have suggestions on how to stop it without resorting to drastic means. ●

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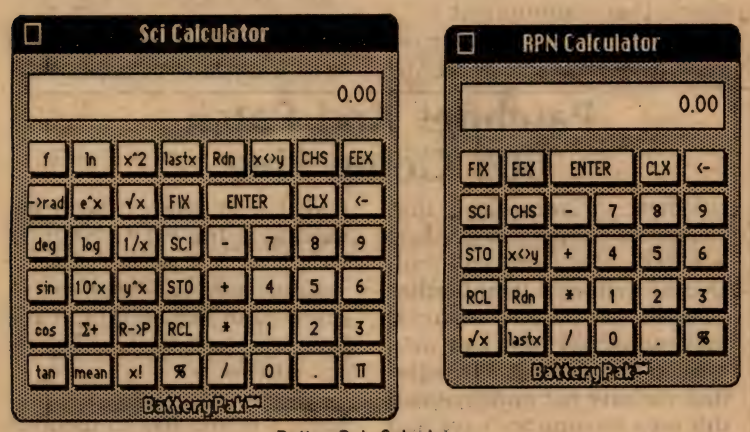
DEALER OEM DISTRIBUTOR SPECIAL PRICE JUST CALL

BatteryPak Review continued from page 60

with two important exceptions. First the user has the option of changing applications without changing systems. This is quite useful if you want to use an application that is on a startup disk while keeping the fonts and desk accessories that are presently installed. Second "Launcher" lets you open a document directly from it.

Calculators: Version 1.1 of BatteryPak goes overboard with calculators. Previously BatteryPak came with just two calculators; a RPN (Reverse Polish Notation) calculator and a scientific calculator. Now it comes with four. Faced with the allegedly immediate release of a new ROM for the Macintosh that will support floating point software, Batteries Included decided to jump the gun and released calculators that are optimized for it. Both sets of calculators include the RPM and Scientific calculators. While the new versions will work with the current ROM, they are recommended only for 512K Macintoshes as the out-of-memory check was removed. Both calculators are much more complex than the one provided by Apple. Among features found on the scientific calculator are automatic memory stacks, the ability to store and recall numbers, a plethoria of dedicated functions keys (e.g. reciprocal, factorial, exponential, logarithmical, summation, and standard deviation, trigonometic, and polar/rectangular conversions).



BatteryPak Calculators

Manual: BatteryPak's instruction manual is one of the best and most readable this reviewer has ever seen in over eight years in microcomputers. In its 100 pages, it not only gives detailed instructions on how to use each desk accessories but goes that "extra mile" by explaining (1) what accessories are appropriate depending on the amount of memory and disk space is available, (2) how to get the most out of each desk accessory, (3) how to trouble shoot a balky or non-functional desk accessory (normally caused by a conflict in ID); and (4) what desk accessories are incompatible with what programs (e.g. DiskTools causes Think Tank 512 to crash).

The Installer: BatteryPak comes with its own desk accessory installer. This program is much more versatile than the Apple Font/DA Mover. First, it allows you to try an accessory before installing it. Second, if there is a conflict between two accessory's ID numbers, the user is (1) warned of the conflict, (2) told that the mover will assign a new ID number, and (3) warned that the Desk Accessory may not work with the new number.

The only advantage of using Apple's Font/DA Mover is that the restrictions that a desk accessory be installed with particular ID numer is lifted. However, as a desk accessory installed with an improper ID number may not work, Batteries Included have included a program, FIX 1.2 BUG, which resolves any incompatibility.

Technical Support: The only bad thing that can be said about the program or its publisher is its technical support. I made more than 15 calls over a three day period. Each one was met with a busy signal. However as stated above, the manual is so good, that the odds are you will never need it.

Conclusion: I have no hesitation whatsoever in recommending BatteryPak to anyone. Each of the individual desk accessories are very well thought out and implemented and the manual is a delight to read and use. Even if you use just two or three of the accessories, they will be worth every penny of the purchase price.

BatteryPak Version 1.1
Batteries Included
Suite P
17875 Sky Park North
Irvine, CA 92714
714-250-8723
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Minimum System Requirement: 128K Macintosh (512K preferred); External Disk Drive Preferred; Imagewriter required for Print Text desk accessory; Hayes compatible modem required for Phone Pad dialer. Copy protection: None. ●

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MacBottom Review continued from page 128

through a utility program the manufacturer provided.

The second bug was discussed earlier and involves use of communications programs and the LaserWriter. The MacBottom when operating off the modem port is incompatible with communications programs. programs.

Finally, while it is not a bug the MacBottom is noisy when compared to a Macintosh. It has a constant hum that some people may find aggravating.

Technical Support

Personal Computer Peripherals provides very good technical support. I have called their technicians four times. In every instance I got through immediately or was called back within a day. The staff was quite knowledgeable and were able to answer all of my questions.

Warranty

The MacBottom comes with a six month parts and labor warranty from Personal Computer Peripherals.

Should You Buy A MacBottom?

As much as I like the MacBottom, I cannot recommend it at this time. Apple has released its own 20 meg hard drive at a lower price than the MacBottom. In doing so, Apple has finally established certain technical standards such as the ability to (1) daisy chain units to each other, (2) work through the external drive port, and (3) supporting the new finder and file system. Until Personal Computer Peripherals announces how it plans to react to Apple's moves, the wise decision would be to buy the Apple hard disk. In the event Personal Computer Peripherals lowers it price to lower than Apple's and meets Apple's new technical specifications, give the MacBottom serious consideration.

Manufacturer

Personal Computer Peripherals, 6204 Benjamin Road, Tampa, Florida 33614. Order number: (800) 622-2888. Tech. Support: (813) 884-3092. Suggested Retail Price; $15.95. ●

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come in three sizes, 500K, 1000K, and 2000K. They can be daisy-chained together to provide up to 32 megabytes of ram disk storage. DASCH units are currently available and a 500K unit has a suggested retail price of $495.

DataSpace also showed its print buffer, MAX, that connects between the Macintosh and the printer. This unit allows the Macintosh to quickly dump information to it which in turn is fed at a slower rate to the printer. In theory, this allows control of the Macintosh to return to the user quicker. The unit comes in a variety of memory sizes ranging from 256K to 1 Megabyte and is Appletalk compatible. The unit is available now. Suggested retail price for the 256K MAX is $695.

The only new Macintosh hard drive seen (at least new to me) was by Paradise. It showed their Mac 10 and Mac 20 hard drives. These are external units that attach through either the Macintosh's printer or modem ports. Either unit can be divided into 26 partitions with a maximum of eight mounted at any one time. The units come with a one year warranty and are available now. The Mac 10 has a suggested price of $999 and Mac 20 $1399.

For the artist, Summagraphics showed its MacTablet. This is a stylus driven graphics tablet that uses a stylus to draw instead of the mouse. Benefits of a stylus over a mouse include ease of tracing art and better control in free hand drawing. The tablet, 6"x9", has a working area the size of the Macintosh screen. Connecting through either the modem or printer port, this unit has a 500 lines-per-inch resolution. The MacTablet is available now at a suggested cost of $495.

New Macintosh Software

Program developers should take a look at MacExpress by AlSoft, Inc. This is a generic application that allows the user to create a complete and consistent user interface. It acts as an application manager in that it provides flow-control for events, men handling, application desktop, and the creation and management of windows, panels, and views. They include activation, resizing, scrolling, splitting, and scaling. The product is available now and has a suggested retail price of $495.

All writers should examine MacSpell + by Creighton Development. This is an interactive spelling program that works with MacWrite or Microsoft Word. With a 75,000 word dictionary, it is currently the largest available. It does phonetic searches, will maintain capital letters, supports hypenation, and has a built-in thesaurus. The program is interactive and the user does not have to leave the word processing program to spell-check the document. According to the representative this checker will work with files exceeding 400K. MacSpell + is currently available at a suggested price of $99. It requires a 512K Mac or MacXL with two disk drives.

DCM Data Products demonstrated its new FORTRAN product, MACTRAN77. This is an integrated FORTRAN development system that consists of an editor, compiler, linker, symbolic debugger, and library manager modules. Even though it is based on the ASNI 77 standards, it supports the Macintosh interface. MACTRAN77 will work on a 128K Macintosh but a 512K system is recommended. The product will start shipping next February at a suggested retail price of $149.

Microphone, a new telecommunications program was announced by Software Ventures. This product was written by Dennis Brothers, the noted Macintosh expert. A Microphone can automate the entire telecommunication process by using macros. Besides MacBinary the programs supports ASCII, MACBINARY, and XMODEM protocols. It is Laserwriter compatible and can be interfaced with Hayes, Apple, U.S. Robotics, and other modems. It can emulate DEC, VT100, VT52,, and TTY type terminals. MicroPhone is only available by mail order. It costs $74.95 and comes with a 30-day, unconditional money-back guarantee.

Game players will want to keep their eyes open for Flight Simulator by SubLOGIC and Orbiter by Spectrum HoloByte. Flight Simulator on the Macintosh is rewrite of earlier versions of Flight Simulator that have long been available

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looking for software to help them improve their math or reading ability, I have found two programs for you. They are Math Blaster! and Speed Reader II. Both are published by Davidson and Associates, a respected name in educational software. Math Blaster contains over 850 math problems spread over 5 levels of difficulties. It is geared for grades one through six and covers addition, subtraction, multiplication, division, fractions, decimals and percents. The publisher uses graphics, animation, sound, and an arcade game. Suggested retail price is $49.95. Math Blaster! comes with a 41 page manual and is copy protected. A backup disk is available for $10 with return of the warranty card.

Speed Reader II is a six part program that improves reading speed. It claims it can double and even triple reading speed. Part one and two use the computer as tachiscope to teach letter and word recognition. Letters or words are flashed onto the screen and the student must later identify them. Correct responses shorten the display time while incorrect responses lengthen it. Part three contains a lesson in eye movement. A paragraph is displayed as brief flashes of word groups work through the text. Part four is column reading. The paragraph is arranged as a group of words in a vertical column. Part five is reading practice. Pages of text are displayed for reading at the speed the reader has selected. Part six is a reading test.

Speed Reader II comes with a 61 page manual that explains in detail how the program works along with some theory behind speed reading. Suggested retail price is $69.95 and the program is copy protected. A backup disk is available for $10 with return of the warranty card.

Books

This month's mail brought only one new book worth noting: *Microsoft Word for the Macintosh: Word Processing for the Professional* by Alan Hoenig. Published by William C. Brown Publishers, this book provides a simplistic approach to dealing with Microsoft Word. The book is only 138 pages and is sketchy in places. Rather than repeat the manual in detail (as many books are apt to do), it spends only 67 pages explaining the various Word commands. The rest of the book is made up of chapters giving detailed explanations how to use Word for creating letters, a resume, a table of contents, an outline, recipe, invoice, newsletter, preparing a play, envelopes, a simple mailing list, and a complex mailing list. Suggested price is $14.95.

This book is not for the dedicated word processing users. It is approprate for someone who just wants to learn the fundamental of Word without getting lost in Word's arcane commands. If you are a power user, a better Word book is Paul Hoffman's *Microsoft Word Made Easy* published by McGraw Hill. This book is 216 pages and covers every Word command in detail. But unlike the Hoenig book, it is not easy to understand. Unless the reader already has a fundamental grasp of word processing and does complicated word processing the Hoffman book is overkill.

While I am on the subject of books, be warned that many booksellers are unloading their copies of Macintosh BASIC books on unsuspecting buyers. The buyer thinks he or she is buying a book about Microsoft Basic for the Macintosh. As explained in earlier columns, Apple has killed Macintosh BASIC and the product will never see the light of day. In particular do not buy Blackadar and Kamin, *The Macintosh BASIC Handbook* published by Sybex and Kamin, *Introduction to Macintosh BASIC*, published by Hayden under the Apple Press name.

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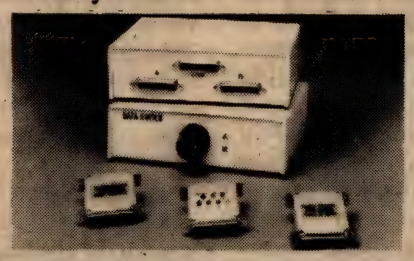

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for the IBM PC and Apple II. The goal of the "game" is to learn how to fly an airplane. The program is so realistic that some flight schools are using it in their ground school. It will be distributed by Microsoft and should be available in the second quarter of 1986.

Orbiter is a space shuttle simulation game designed for a 512K Macintosh. It uses 3-D graphics and a voice synthesis to provide a realistic arena for the game. The pilot must complete a mission and receives a score based on performance throughout the entire space mission. According to publisher the visuals are so unique that the user will actually see solid objects changing position as his or her orientation to the screen changes. Orbiter is available now at a suggested retail price of $49.95.

Finally Satori Software has released the first legal billing system for the Macintosh. Called Legal Billing, this product is designed as a professional time billing package suitable for attorneys, accountants, consultants, or anyone else who bills for time and expenses. The system allows up to 45 action codes, and 27 employees. It supports a maximum of 900 clients. Legal Billing is currently available at a suggested retail price of $595.

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Mac 10 Hard Disk

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South San Francisco, CA 94080
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Berkley, CA 95705
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Price: $74.95

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Spectrum Holobyte Inc.
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Boulder, CO 90302
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SubLOGIC Corp.
713 Edgebrook Dr.
Champaign, IL 61820
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Price: Unknown

Legal Billing

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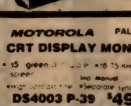

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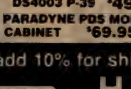

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MacUniverse continued from page 133

Apple Hard Disk Warning

A lot of people are reporting problems with Apple's hard disk. Problems tend to involve getting desk accessory and communication programs to work. As far as I can tell, many of the problems are arising from the unit's unique file structure. Some programs are unable to comprehend it. For example, many communications programs cannot find their automatic log-on procedures unless they are stored in the folder as the program.

Until these problems are resolved be wary in buying this unit. In all probability these problems will simply be resolved, but if you have some program or desk accessory that must be used, make sure it works before you pay your money.

Compuserve Material

This month's Compuserve selection covers three files; two application programs and one disk accessory.

The first application is a ram disk program calle RAM START. Its file name is RAMSTA.BIN and is found in DL1 under PPN 75015,545. RAM START program creates a ram disk that automatically copies files onto itself, ejects the physical startup disk, and makes the ram disk the new startup disk. Ram disk size can range from 6K to 374K. RAM START has a built in help file and supports a unique scripting feature that allows the user to control what files are copied onto the ram disk. RAM START is a public domain program and users are encouraged to pass it on.

The second application is called File Converter. It is a quick and dirty file converter that will do global search and change operation on text files up to 15K in size. The program is very simple to use and contains a built-in help file. Merely type in the word or phrase to be changed and the replacement. Then click the "Change All" box. The modified file will be saved under the name "Filter File" or another name of your choosing. This program is shareware and the author requests $5 if the program is kept. Its file name is FLCVTR.BIN and is found in DL1 under PPN 70116,1155.

The desk accessory is Quick Print (QP). It allows the quick and easy printing of text files. QP should work with most printers and from within most applications. If it detects that an imagewriter is being used, it will offer a selection of fonts, print the page header in bold, and initialize Xon/Xoff handshaking and hardware handshaking on the currently selected printer port. Otherwise, QP assumes that the printer uses an elite font, prints 66 lines per page, and requires a linefeed after a carriage return. QP offers the following features:

Fast spool printing of text files.

Dialog driven formatting features.

Optional page header with date, time, filename, and page number.

Automatic page break.

Adjustable left and right margins.

Variable tab settings (equally spaced).

Optional line numbers.

Line wraparound.

Selection of fonts. (Imagewriter only)

Quick Print is distributed on the shareware basis. If you like it, send $7.00 to the author. If you want to learn how to customize Quick Print, send $15.00 for a disk with the latest version of Quick Print and instructions on how to customize it using the resource editor. If you really want to dig into the product, send $30.00 for a disk with all of the above, and the source code.

Quick Print is found in the DL1 database under the name QPDA.BIN. The documentation file is names QPWRT.BIN. Both files are found under PPN 76174,1136.

Products Mentioned In This Column

File Converter

Stored in DL1 under name

continued on page 136

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SHIPPING: We pay the shipping on all orders. All orders shipped UPS ground unless otherwise requested.

PAYMENT: We ship all orders COD. We also accept MasterCard and Visa. There are no additional charges for COD or credit cards. We offer 3% discount for prepayment.

DataTech DISTRIBUTORS

New Internal Disk Drive
continued from page 60

ing spreadsheets in one file drawer, word-processing documents in another and database files in a third.

The Security utility provides more sophisticated file security than does simple password protection. The security program protects files by scrambling their contents using standard encryption techniques that are nearly impossible to break. The third utility, Disk Backup, allows data to be quickly transferred from the hard disk to floppy disks to ensure against unexpected loss of data.

The Print Spooler utility lets a person use the Macintosh for other operations while printing documents. For example, users can continue to edit a document while an intermediate draft is being printed.

Pricing, Availability, Service

A HyperDrive 20 internal disk sells for $2,795. As a part of General Computer's continuing commitment to existing HyperDrive users, the firm will also offer a special program in which users of 10-megabyte capacity at a cost of $895. The upgrade is available.

Both HyperDrive 20 and HyperDrive units properly installed by an authorized General Computer dealer will not void Apple's 90-day warranty or AppleCare coverage on the Macintosh. In addition, General Computer offers a complete 90-day warranty on its two products as well as an extended warranty program, called HyperCare, which works in concert with AppleCare to provide complete, long-term protection for up to three years.

General Computer sells its products through a retail network that includes more than 1,000 authorized Apple dealers.

For additional information contact General Computer Company, 215 First Street, Cambridge, MA 02142; (617) 492-5500.

Mention that you read about it in *Computer Shopper*. ●

MacUniverse
continued from page 135

FLCVTR.BIN under PPN 70116,1155.
Phillip Software
1633 Commonwealth Avenue
West Newton, MA 02165
$5 Shareware

Quick Print

Stored in DL1 under the name QPDA.BIN and PPN 76174,1136
Documentation file is QPWRT.BIN
William B. Poucher
232 Oklahoma
Hewitt, TX 76643
$7 Shareware

RAMSTART - Public Domain

Stored in DL1 under the name RAMSTA.BIN under PPN 75015,545

Hoenig, *Word Processing for the Professional*

Wm. C. Brown Publishers
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(213) 534-4070
Suggested Retail: $49.95

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Apple Computer
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Suggested Retail: $5995

Apple Laserwriter Toner Cartridge

Apple Computer
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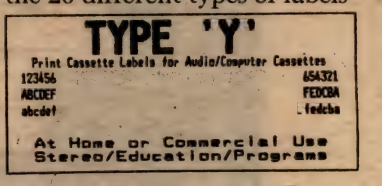
Cupertino, CA 95014
(418) 996-1010
Suggested Retail: $90 ●

Tandy Topics
continued from page 68

Data Disk Drive is # tells you where the data files are filed.

The selection options (See Fig. 1) are for "A"dding an entry, "E"dit, "P"rint and "D"isplay Label Types. First select "D" and scroll through the 26 different types of labels



available. Select the one that will do what you need and remember its entry number. "A"dd and entry allows you to use an existing label type from the 26 offered to create your own label to use.

The process of creating and printing a label can take less than a minute from start to finished product. Figures 2, 3 and 4 show the process from selecting **TYPE Y**, editing the example and the finished

continued on page 144

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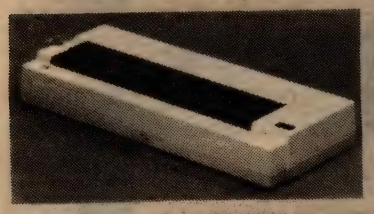

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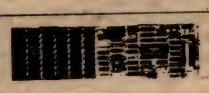

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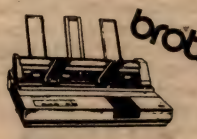

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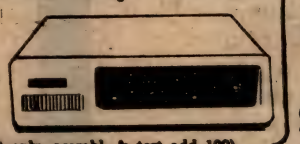

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74LS10	.16	74LS193	.69
74LS11	.22	74LS194	.69
74LS12	.22	74LS195	.69
74LS13	.26	74LS196	.59
74LS14	.39	74LS197	.59
74LS15	.26	74LS221	.59
74LS20	.17	74LS240	.69
74LS21	.22	74LS241	.69
74LS22	.22	74LS242	.69
74LS27	.23	74LS243	.69
74LS28	.26	74LS244	.69
74LS30	.17	74LS245	.79
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74LS33	.28	74LS253	.49
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7414	.49	74159	1.65
7416	.25	74161	.69
7417	.25	74163	.69
7420	.19	74164	.85
7423	.29	74165	.85
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7442	.49	74178	1.15
7445	.69	74181	2.25
7447	.89	74182	.75
7470	.35	74184	2.00
7473	.34	74191	1.15
7474	.33	74192	.79
7475	.45	74194	.85
7476	.35	74196	.79
7483	.50	74197	.75
7485	.59	74199	1.35
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7489	2.15	74246	1.35
7490	.39	74247	1.25
7492	.50	74248	1.85
7493	.35	74249	1.95
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TL084	1.49	MC1372	6.95
LM301	.34	LM1414	1.59
LM309K	1.25	LM1458	.49
LM311	.59	LM1488	.49
LM311H	.89	LM1489	.49
LM317K	3.49	LM1496	.85
LM317T	.95	LM1812	8.25
LM318	1.49	LM1889	1.95
LM319	1.25	ULN2003	.79
LM320	see7900	XR2206	3.75
LM322	1.65	XR2211	2.95
LM323K	4.79	XR2240	1.95
LM324	.49	MPQ2907	1.95
LM331	3.95	LM2917	1.95
LM334	1.19	CA3046	.89
LM335	1.40	CA3081	.99
LM336	1.75	CA3082	.99
LM337K	3.95	CA3086	.80
LM338K	3.95	CA3089	1.95
LM339	.59	CA3130E	.99
LM340	see7800	CA3146	1.29
LM350T	4.60	CA3160	1.19
LF353	.59	MC3470	1.95
LF356	.99	MC3480	8.95
LF357	.99	MC3487	2.95
LM358	.59	LM3900	.49
LM380	.89	LM3909	.98
LM383	1.95	LM3911	2.25
LM386	.89	LM3914	2.39
LM393	.45	MC4024	3.49
LM394H	4.60	MC4044	3.99
TL494	4.20	RC4136	1.25
TL497	3.25	RC4558	.69
NE555	.29	LM13600	1.49
NE556	.49	75107	1.49
NE558	1.29	75110	1.95
NE564	1.95	75150	1.95
LM565	.95	75154	1.95
LM566	1.49	75188	1.25
LM567	.79	75189	1.25
NE570	2.95	75451	.39
NE590	2.50	75452	.39
NE592	.98	75453	.39
LM710	.75	75477	1.29
LM723	.49	75492	.79

H=TO-5 CAN, K=TO-3, T=TO-220

IC SOCKETS

	1-99	100
8 PIN ST	.11	.10
14 PIN ST	.11	.09
16 PIN ST	.12	.10
18 PIN ST	.15	.13
20 PIN ST	.18	.15
22 PIN ST	.15	.12
24 PIN ST	.20	.15
28 PIN ST	.22	.16
40 PIN ST	.30	.22
64 PIN ST	1.95	1.49

ST=SOLDERTAIL

8 PIN WW	.59	.49
14 PIN WW	.69	.52
16 PIN WW	.69	.58
18 PIN WW	.99	.90
20 PIN WW	1.09	.98
22 PIN WW	1.39	1.28
24 PIN WW	1.49	1.35
28 PIN WW	1.69	1.49
40 PIN WW	1.99	1.80

WW=WIREWRAP

16 PIN ZIF	4.95	CALL
24 PIN ZIF	5.95	CALL
28 PIN ZIF	6.95	CALL
40 PIN ZIF	9.95	CALL

ZIF=TEXTOOL
(ZERO INSERTION FORCE)

DATA ACQ INTERFACE

ADC0800	15.55	8T26	1.29
ADC0804	3.49	8T28	1.29
ADC0809	4.49	8T95	.89
ADC0816	14.95	8T96	.89
ADC0817	9.95	8T97	.59
ADC0831	8.95	8T98	.89
DAC0800	4.49	DM8131	2.95
DAC0806	1.95	DP8304	2.29
DAC0808	2.95	DS8833	2.25
DAC1020	8.25	DS8835	1.99
DAC1022	5.95	DS8836	.99
MC1408L8	2.95	DS8837	1.65

EDGECARD CONNECTORS

100	PIN ST	S-100	.125	3.95
100	PIN WW	S-100	.125	4.95
62	PIN ST	IBM PC	.100	1.95
50	PIN ST	APPLE	.100	2.95
44	PIN ST	STD	.156	1.95
44	PIN WW	STD	.156	4.95

36 PIN CENTRONICS

MALE

IDCEN36	RIBBON CABLE	6.95
CEN36	SOLDER CUP	4.95
CEN36PC	RT ANGLE PC MOUNT	4.95

FEMALE

IDCEN36/F	RIBBON CABLE	7.95

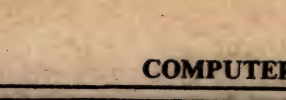
INTERSIL

ICL7106	9.95
ICL7107	12.95
ICL7660	2.95
ICL8038	4.95
ICM7207A	5.95
ICM7208	15.95

DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS 8	14	16	18	20	22	24	28	40
HIGH RELIABILITY TOOLED ST IC SOCKETS	AUGATxxST	.62	.79	.89	1.09	1.29	1.39	1.49	1.69	2.49
HIGH RELIABILITY TOOLED WW IC SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIES (DIP HEADERS)	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
RIBBON CABLE DIP PLUGS (IDC)	IDPxx	---	.95	.95	---	---	---	1.75	---	2.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE BELOW


ICC16 IDP14

AUGAT 24ST

DIODES/OPTO/TRANSISTORS

1N751	.25	4N26	.69
1N759	.25	4N27	.69
1N4148	25/1.00	4N28	.69
1N4004	10/1.00	4N33	.89
1N5402	.25	4N37	1.19
KBP04	.55	MCT-2	.59
KBU8A	.95	MCT-6	1.29
MDA990-2	.35	TIL-111	.99
N2222	.25	2N3906	.10
PN2222	.10	2N4401	.25
2N2905	.50	2N4402	.25
2N2907	.25	2N4403	.25
2N3055	.79	2N6045	1.75
2N3904	.10	TIP31	.49

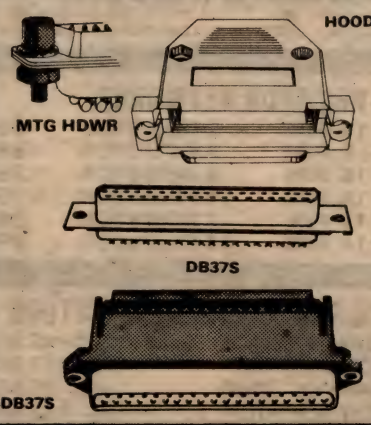
D-SUBMINIATURE

DESCRIPTION		ORDER BY	CONTACTS 9	15	19	25	37	50
SOLDER CUP	MALE	DBxxP	.82	.90	1.25	1.25	1.80	3.48
	FEMALE	DBxxS	.95	1.15	1.50	1.50	2.35	4.32
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	1.20	1.49	---	1.95	2.65	---
	FEMALE	DBxxSR	1.25	1.55	---	2.00	2.79	---
WIRE WRAP	MALE	DBxxPWW	1.69	2.56	---	3.89	5.60	---
	FEMALE	DBxxSWW	2.76	4.27	---	6.84	9.95	---
IDC RIBBON CABLE	MALE	IDBxxP	2.70	2.95	---	3.98	5.70	---
	FEMALE	IDBxxS	2.92	3.20	---	4.33	6.76	---
HOODS	METAL	MHOODxx	1.25	1.25	1.30	1.30	---	---
	GREY	HOODxx	.65	.65	---	.65	.75	.95

ORDERING INSTRUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED.

EXAMPLE: A 15 PIN RIGHT ANGLE MALE PC SOLDER WOULD BE DB15PR.

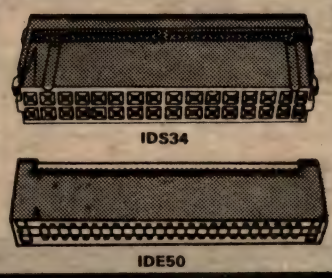
MOUNTING HARDWARE $1.00


HOOD25
MTG HDWR
DB37S
IDB37S

IDC CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS 10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WW HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WW HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.79	.99	1.39	1.59	1.99	2.25
RIBBON HEADER	IDMxx	---	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	1.75	2.25	2.65	2.75	3.80	3.95

FOR ORDERING INSTRUCTIONS SEE D-SUBMINIATURE ABOVE


IDS34
IDE50

LED DISPLAYS

FND-357(359)	COM	CATHODE	.362"	1.25
FND-500(503)	COM	CATHODE	.5"	1.49
FND-507(510)	COM	CATHODE	.5"	1.49
MAN-72	COM	ANODE	.3"	.99
MAN-74	COM	CATHODE	.3"	.99
MAN-8940	COM	CATHODE	.8"	1.99
TIL-313	COM	CATHODE	.3"	.45
HP5082-7760	COM	CATHODE	.43"	1.29
TIL-311	4x7	HEX W/LOGIC	.270"	9.95
HP5082-7340	4x7	HEX W/LOGIC	.290"	7.95

DIFFUSED LEDS

		1-99	100-UP
JUMBO RED	T1¾	.10	.09
JUMBO GREEN	T1¾	.14	.12
JUMBO YELLOW	T1¾	.14	.12
MOUNTING HDW	T1¾	.10	.09
MINI RED	T1	.10	.09

SWITCHES

SPST	MINI-TOGGLE ON-ON	1.25
DPDT	MINI-TOGGLE ON-ON	1.50
DPDT	MINI-TOGGLE ON-OFF-ON	1.75
SPST	MINI-PUSHBUTTON N.O.	.39
SPST	MINI-PUSHBUTTON N.C.	.39
SPST	TOGGLE ON-OFF	.49
BCD OUTPUT 10 POSITION 6 PIN DIP		1.95

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4 POSITION	.85	7 POSITION	.95
5 POSITION	.90	8 POSITION	.95
6 POSITION	.90	10 POSITION	1.29

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CONTACTS	SINGLE COLOR 1'	10'	COLOR CODED 1'	10'
10	.18	1.60	.30	2.75
16	.28	2.50	.48	4.40
20	.36	3.20	.60	5.50
25	.45	4.00	.75	6.85
26	.46	4.10	.78	7.15
34	.61	5.40	1.07	9.35
40	.72	6.40	1.20	11.00
50	.89	7.50	1.50	13.25

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- SLIPS OVER WIRE WRAP PINS
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- CAN WRITE ON PLASTIC; SUCH AS IC #

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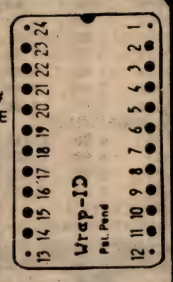
14	IDWRAP 14	10	1.95
16	IDWRAP 16	10	1.95
18	IDWRAP 18	5	1.95
20	IDWRAP 20	5	1.95
22	IDWRAP 22	5	1.95
24	IDWRAP 24	5	1.95
28	IDWRAP 28	5	1.95
40	IDWRAP 40	5	1.95

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)



ID WRAP 24

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12.6V AC CT	8 AMP	10.95
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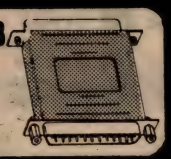

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- SWITCH ON REAR
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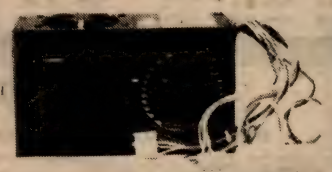
PS-130

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6.8	15V	.70	1.0	35V	.45
10	15V	.80	2.2	35V	.65
22	15V	1.35	4.7	35V	.85
.22	35V	.40	10	35V	1.00

DISC
10pf	50V	.05	680	50V	.05
22	50V	.05	.001µf	50V	.05
27	50V	.05	.0022	50V	.05
33	50V	.05	.005	50V	.05
47	50V	.05	.01	50V	.07
68	50V	.05	.02	50V	.07
100	50V	.05	.05	50V	.07
220	50V	.05	.1	12V	.10
560	50V	.05	.1	50V	.12

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.01µf	50V	.14	.1µf	50V	.18
.047µf	50V	.15	.47µf	50V	.25

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1µf	25V	.14	1µf	50V	.14
2.2	35V	.15	10	50V	.16
4.7	50V	.15	22	16V	.14
10	50V	.15	47	50V	.20
47	35V	.18	100	35V	.25
100	16V	.18	220	25V	.30
220	35V	.20	470	50V	.50
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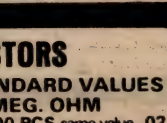

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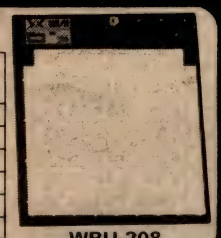
WBU-204	5.13 x 8.45"	4	400	2	1260	3	24.95
WBU-206	6.88 x 9.06"	5	500	3	1890	4	29.95
WBU-208	8.25 x 9.45"	7	700	4	2520	4	39.95


WBU-208

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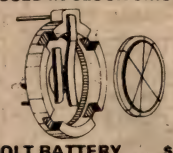

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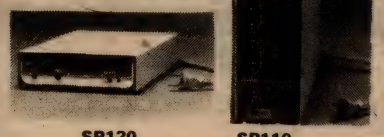
* 64K UPGRADABLE TO 256K
* LED INDICATOR SHOWS VOLUME OF DATA IN BUFFER

SP120S RS232 SERIAL $159.95
* 64K UPGRADABLE TO 256K
* SIX SELECTABLE BAUD RATES FROM 600B — 19,200B

SP110 PARALLEL $249.95
* 64K UPGRADABLE TO 512K
* SPOOLS OUTPUT OF UP TO THREE COMPUTERS
* LED BARGRAPH DISPLAYS AMOUNT OF DATA IN BUFFER
* RESET FUNCTION CLEARS DATA IN BUFFER
* REPEAT FUNCTION CAN PRODUCE MULTIPLE COPIES OF A DOCUMENT



SP120 SP110

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* SERIAL OR PARALLEL
* CONNECTS 3 PRINTERS TO 1 COMPUTER OR 3 COMPUTERS TO 1 PRINTER
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* HIGH QUALITY ROTARY SWITCH MOUNTED ON PCB
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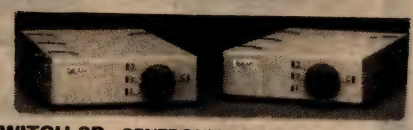

SWITCH-3P CENTRONICS PARALLEL 99.95
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SHUGART
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TEAC FD-55B

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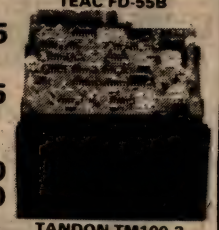

TANDON TM100-2

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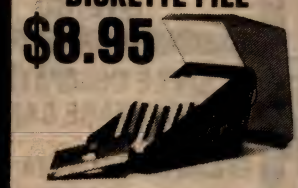

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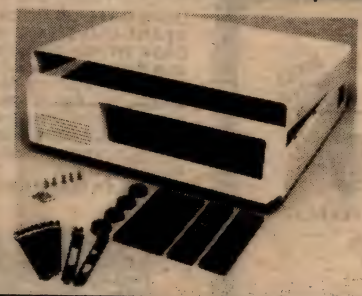

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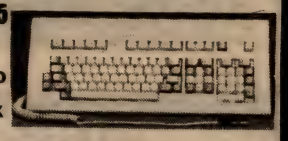

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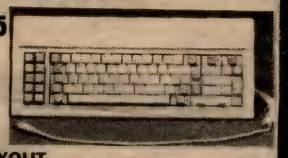
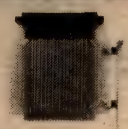


EXTENDER CARDS



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* TRIGGERING OF CH-A, CH-B, ALTERNATING, LINE OR EXTERNAL
* X-Y AND Z AXIS OPERATION

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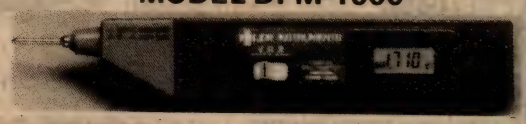

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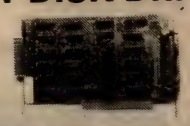

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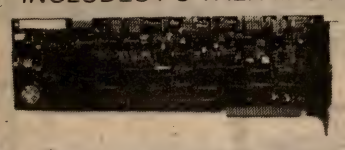

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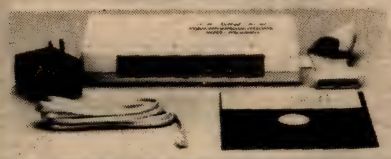

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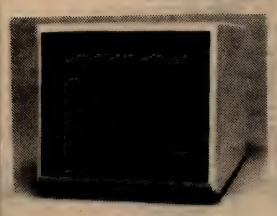

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- 12" BLACK MATRIX
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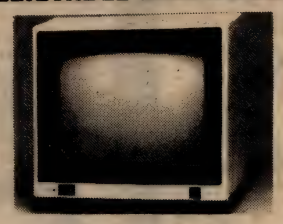

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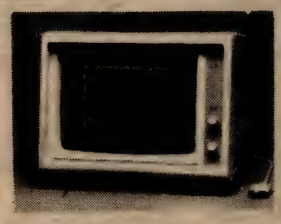

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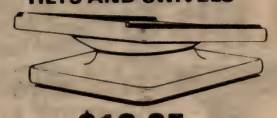

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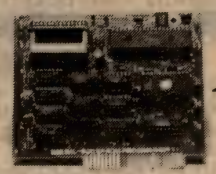

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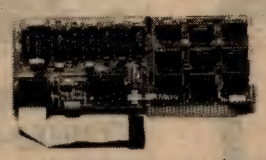

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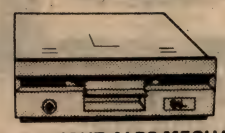

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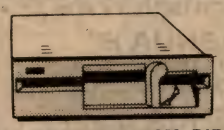

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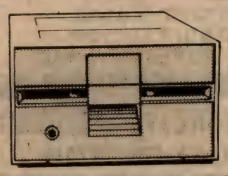

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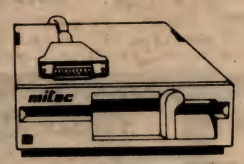

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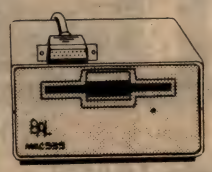

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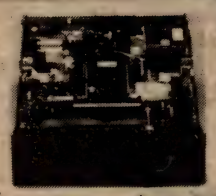

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FOR APPLE COMPUTERS

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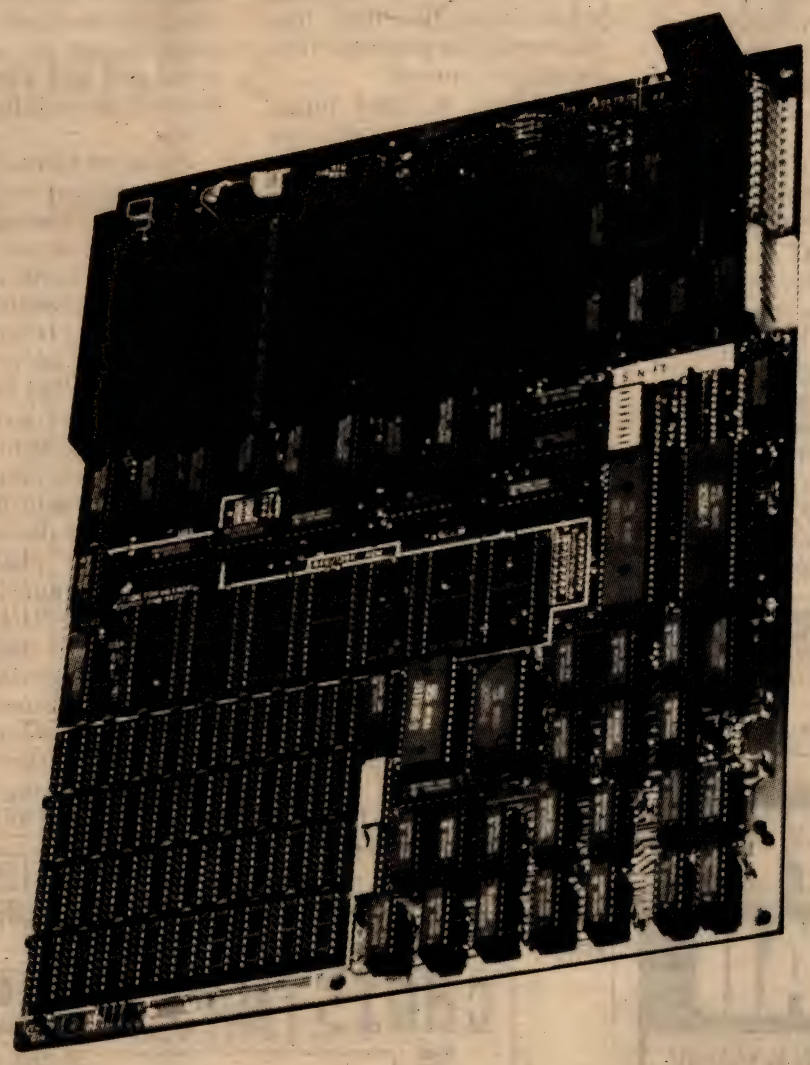

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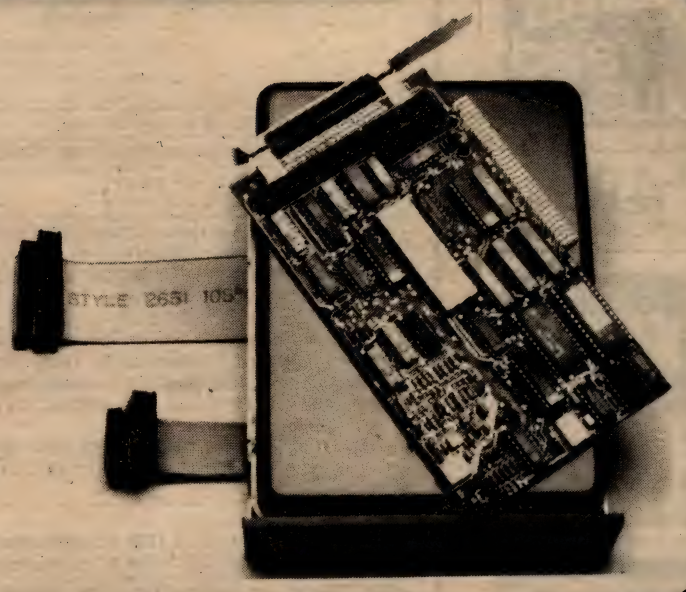

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Tandy Topics
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cassette label. The only thing you have to watch is upper/lowercase and add a trailing blank to your line if you want it centered on the label. (See Figs. 2, 3, 4) The rest is done for you.

After your label is stored on disk you can call it up later to "E"dit it and print or save it. Labels can be "D"eleted from the edit mode. Scrolling through the label file is a function offered in the edit mode. Otherwise the options are pretty much the same as the "Add an entry selection."

The "P"rint selection prompts you for start entry # and stop entry # and number of copies. This means that you can make multiple copies of more than one type of label on the same printing process. Alignment of the label forms can be a pain but **ETS** walks you through a process that when done the first time eliminates the problems from that point onward.

Speaking of label forms, **ETS CENTER** carries just about any type tractor feed label that you might need, even cassette tape labels. Various colors are also available. Those can be sampled in a $5.00 assortment when you order the progam. They also have the nice plastic name badges with the clips (the pin type is also available).

One other selection available from the main menu screen is found at the bottom right .. "!" "?" The question displays the current configuation values and "!" will access the reconfigure screen to allow changing the values. This function is well covered in the docs and should present no problem.

EST has supplied a large number of possible applications for **LABLMAKR**. I can add many more with little or no effort. It is amazing how many uses I can find for this program. The cassette and return mail labels have saved me a lot of time and effort. The labels turned out are professional and add a lot to what ever you are working on at the time.

I have yet to be able to hang up the program or find a real fault with it. The only inconveniences I have are the use of the "signature" diskette and the use of letters to designate label types in the "D"isplay mode and the use of numbers to "E"dit or "A"dd labels. You have to convert the letters to a number of 1 to 26 to use them.

The documentation is well written and easily understood. The **MS-DOS** documentation is in a 6" x 9" plastic folder. The old program that I have for the Model III/4 is simply several 8½ x 11 sheets stapled together. Either way they do the job well. Customer support by **ETS** is excellent. I found this out with the first program I purchased (long before I started reviewing software). By the way, look at another product that **ETS** offers - The Disk-O-Tier. Excellent way to protect the disks that you are working with at the computer.

All in all this is an excellent program. Even if you don't need it now you will find so many uses for it that you will be glad that you bought it.

LABLMAKR for Tandy 1000 ($49.00), Models I, III and 4 ($29.50)
ETS Center
Box 651 35026-A Turtle Trail
Willoughby, Ohio 44094
(216) 946-8479

Backrest

Powersoft has done it again. This package can be the best thing that has happened to you in some time. Backrest for TRS 80 Models I, III and IV requires 49K, one floppy and a hard disk. It provides a fast backup of your hard drive, something I tend to put off as it requires more time than I want to spend. As soon as I do put it off for whatever reason, you know what happens. Murphy strikes with unerring aim and I spend a lot of time paying for the time I "saved."

Hard drives are a mixed blessing to most of us. The faster access makes many operations much less painful and the amount of data that can be stored eliminates fooling around with a lot of disks. But...putting all your eggs in one basket can make for a large omelette if the disk "crashes." Enter Backrest (stage right).

The program is supplied on a single density floppy for LDOS 5.1 or TRSDOS 6.x. On the disk is an installation program, INSTALL/CMD, that will move the program to your disk. Put it on your boot diskette even if you do put it on your hard disk. It won't do you much good on your HD if you can't access it for some reason.

In order to use Backrest you will have to have enough formatted floppies on hand to handle the data on your HD. Rather than trying to calculate how many you need from the directories let Backrest do the job for you. Run the program and it will tell you how many disks to prepare (40 or 80 trk. and single or double sided disks). BREAK the program and format the disks. Once you have the necessary disks you are ready to backup your hard drive.

The following guidelines should be followed: Make absolutely sure all the disks are formatted *exactly alike* (# of cylinders, sides and density); No flawed tracks or locked out tracks are permissible; Label and number the disks carefully so that you don't get them mixed up.

From DOS execute Backrest. The program will prompt you for needed parameters. It is possible to enter the parameters on the command line but the program will call for them if you don't. You will be asked if you have the required number of formatted disks ready. If not you are returned

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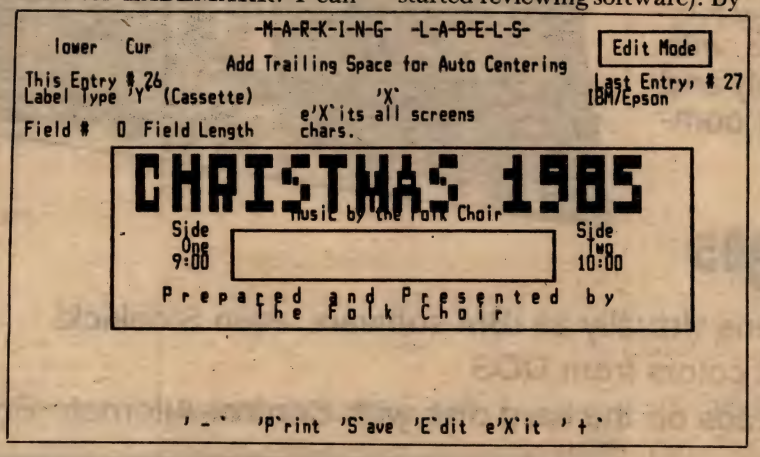
-M-A-R-K-I-N-G- -L-A-B-E-L-S-
lower Cur
Add Trailing Space for Auto Centering
Edit Mode
This Entry # 26
Label Type 'Y' (Cassette)
'X' e'X'its all screens
Last Entry, # 27
IBM/Epson
Field # 0 Field Length chars.
CHRISTMAS 1985
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Side One 9:00
Side Two 10:00
Prepared and Presented by The Folk Choir
' - ' 'P'rint 'S'ave 'E'dit e'X'it ' + '

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C ITOH Prowriter 1550-8510, NEC 8023-8025, APPLE DMP-IMAGEW	1/2 x 18	$15/2	$42/6	$ 78/12	$7/1	$6 ea 2 or more	$15/3	$54/12	$288/72
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DIABLO HYTYPE II — Fabric Black	NOT EZ-LOAD 5/16 x 17	$18/2	$51/6	$ 96/12	$8/1	$7 ea 2 or more	$21/3	$78/12	$432/72
RADIO SHACK-TOSHIBA-COMMODORE-PANASONIC-RICOH									
Carbon Film - DWP 210 (Hytype II) Black (1445)	5/16 x 145	$18/3	$60/12	$342/72	$5 ea 3-11	$4 ea 12 or more	$24/6	$42/12	$234/72
DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1419)	1/4 x 145	$18/3	$60/12	$342/72	$5 ea 3-11	$4 ea 12 or more	$24/6	$42/12	$234/72
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DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1449)	1/4 x 25	$18/2	$51/6	$ 96/12	$8/1	$7 ea 2 or more	$21/3	$78/12	$432/72
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DMP-200, 120, (430 Inserts & Reloads Only) (1296) (1483)	1/2 x 20	$20/2	$57/6	$108/12	$7/1	$7 ea 2 or more	$15/3	$54/12	$288/72
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-5500-7700 (Can Reload Most Types)	1/4 x 145	$18/3	$60/12	$342/72	$5 ea 3-11	$4 ea 12 or more	$24/6	$42/12	$234/72
-Fabric -2000-3500 (Can Reload All)	1/2 x 14	$18/2	$51/6	$ 96/12	$8/1	$7 ea 2 or more	$15/3	$54/12	$288/72
-5500-7700 (Can Reload All)	1/2 x 13	$15/2	$42/6	$ 78/12	$8/1	$7 ea 2 or more	$15/3	$54/12	$288/72
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P3	1/2 x 27	$30/2	$84/6	$156/12	$8/1	$7 ea 2 or more	$18/3	$66/12	$360/72
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Tandy Topics continued from page 144

to DOS. If you do place one in the target, or destination, drive and answer "Yes."

Backrest will begin to copy all allocated granules from the HD to the floppy. As the floppies fill up you are prompted for a new one. Verify is not done as a default. It must be specified at the command line. Obviously this slows the backup procedure considerably. When the backup is finished the start and finish times will be displayed.

The disks that are used for backup should be stored. Don't try to use them as you will get a no files message from DOS. The disks are filled with an image of the section of the HD that was copied to each disk. The directories will not reflect what is on the disks. They should only be used to RESTORE the hard drive.

The RESTORE option is in essence the reverse of the backup procedure. You are restoring a hard drive partition from the floppies that were prepared by the backup. Once the RESTORE process has started the program will prompt for insertion of floppies. Continue to insert the floppies, in any order, until they have all been run. Once this has been completed stop the restoration by using the BREAK key.

A single file can also be restored. As a matter of fact the entire group of floppies used for the backup can be treated as a single disk for COPY, DIR or BACKUP by class using the BACKUP/CMD. In this manner you can move single files or a group of files to the hard disk. RESTORE will prompt you for the necessary disk by number. This is why it is so important to number the backup disks sequentially and not get them mixed up.

For TRSDOS 6.x, LDOS or DOSPLUS 3.5 you can't beat Backrest for speed and convenience especially if you have a lot of small files or a large data base or two. Backrest doesn't care if the file is larger than your floppy. It will simply call for another disk when the first one is full. It will only copy the allocated granules rather than making a mirror image of the entire disk--no wasted time. RCOPY for DOSPLUS IV is faster but doesn't have the flexibility that Backrest contains.

Backrest's documentation is like other Powersoft offerings...direct, to the point, well written and easy to understand. I wish more companies would follow their lead. The only comment that could be interpreted as negative is one on the format of the printed material. I would like to see the cover, or title page, match the rest of the documentation so that they will all go in a loose leaf folder. Small nit to pick but then again my wife tells me I do that all the time.

This program is excellent. It runs without fault and is very easy to use. Once you use it you, will wonder how you ever got along without it! If you backup your hard drive, Backrest will save you time and effort. If you don't backup your hard drive, I hope Murphy doesn't know your address!

Backrest
$99.95
Radio Shack Third Party Cat #90-0244
Powersoft Products
17060 Dallas Parkway, Suite 114
Dallas, TX 75248
(214) 773-4475

Vocabulator

Vocabulator from Zephyr Services is a Computer Aided Instruction (CAI) package for increasing your vocabulary ability through the user of your computer. CAI requires as much, and sometimes more, effeort as classroom instruction so don't expect overnight brilliance. It will take some work on your part but in the case of Vocabulator it is definitely worth the effort. I try not to tell my kids how hard it was when I went to school. You know how it goes ...I walked 5 miles to school ...uphill both ways ...in the snow and sleet ...no shoes ...etc. Then one of them reminds me that it doesn't snow very often in St. Petersburg Florida and the whole illusion is shot. Anyway I sure could have used the Vocabulator when I was in school except for the simple fact that there were no computers.

This package is available for the IBM and compatibles and the Apple II+/IIe/IIc. The program is provided on a single sided, double density disk that is not copy protected (Thank you Zephyr). Getting the Vocabulator up and running is simple with no fancy gimmicks or tricks. Copy the disk, get to DOS READY and type "VOCAB" and the program loads and runs.

The menu for Vocabulator allows the following choices: Multiple Choice Testing, Flash

continued on page 146

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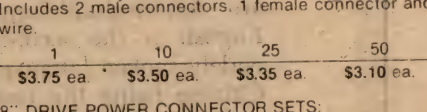

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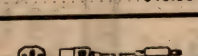

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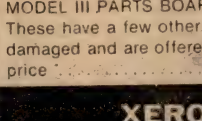

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Tandy Topics continued from page 145

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********** VOCABULATOR *********
MAIN MENU

1 How To Use VOCABULATOR
2 Multiple Choice Testing
3 Flash Card Mode
4 Add Words To Personal Vocabulary List
5 Use Personal Vocabulary List
6 Facts About Vocabulary and Language
7 Print Words in Personal Vocabulary List
8 Print Words in Personal Vocabulary List
9 EXIT program and return to DOS

ENTER your choice

****** MULTIPLE CHOICE TESTING ******

Word:      BARRATRY

POSSIBLE MEANINGS:    1 ENCLOSURE
                      2 EMPTINESS
                      3 KIND OF FRAUD
                      4 LEGAL OPINION

.....
```

Multiple Choice Sample

Card MOde, Add Words To Personal Vocabulary List, Use Personal Vocabulary List, Facts About Vocabulary and Langauge, Print Words in Personal Vocabulary List and Exit to DOS.

The actual use of the program is self explanatory once you are at the main menu. Vocabulator leads you through each selection with no problems. In the Multiple Choice selection you are asked to select a level of difficulty: Moderate, Intermediate, Advanced or Difficult. A few of the words presented for definitions in the difficult level are Barratry, Mastic, Vatication, Appanage and Maunder. I started at Moderate and Vituperation, Depredation and Matutinal. Did you get all those?

The testing modes, Multiple Choice and Flash Card are both excellent. Multiple Choice provides four choices. The programe reacts with "Correct" or with the correct choice if you are incorrect. At the end of the session, you are given your score. The Flash Card selection shows the word and you can call up the meaning by hitting "F". The program docs tell you to start with a level and stay with it until you get 100% for all the words at that level and then move on to the next level. Between the levels there are about a thousand words to use. You can add another 2000 (1000 for Apple) in your Personal Vocabulary List. I took the time to look through the lists provided in the docs for the various levels and I will be a while before I finish. The docs speak in terms of "a few months or regular practice." This is not the sort of program you use once in awhile and expect results. Frequent short sessions will provide results that will please you in a month or so.

I like the Personal Vocabulary List feature as it allows you to tailor the program to your particular needs. This listing might be used for professional improvement or educational use for certain classes or disciplines. The possible applications are limitless.

The Facts about Vocabulary and Language selection produces some interesting tidbits. Of the 2800 languages spoken through the world today, 1000 are Amerindian languages. English is the second most widely spoken language with Chinese being the first. The section on English vocabulary interests me even more.

The author(s) recommend that you start with Multiple Choice testing in the moderate level and stay with it until you are getting most of the words correct and then switch to the Flash Card Mode. This gives you a more accurate indication of how well you know the words as no meanings are displayed to prompt you. Stay with the moderate level until you have mastered all the words and then move up to the Intermediate level and start over with multiple choice. As you progress don't forget to drop back to the lower levels occassionally to review and refresh your memory.

As your vocabulary increases look for opportunities to use the words in your conversations and written work. Watch for the new words in your reading. Knowledge is like a muscle - unless you stretch it occassionally it will grow weak and astrophy.

How well does the program work? Very well. I was unable to find a real problem. Once in awhile it stuttered when I used the "X" option to quit the program but it was no real problem. It runs well in all levels and modes.

Would I buy it? Yes, if I were interested in increasing my (or my teenager's) vocabulary. It is not for elementary use unless you develop the personal list at a lower level for the young'ns. It definitely is not a game but a serious tool for vocabulary tutoring.

The Vocabulator: IBM PC/XT/ jr/AT and compatibles. Apple II+/IIe/IIc, Zephyr Services, 306 S. Homewood Avenue, Pittsburg, PA 15208, 412-247-5915.

FastPak--Mailing List System

First Impressions

The advertisement for FastPak Business Mail System sounds like a cure-all claim at a snake show. When you come to the price you are sure that someone is nuts or at the very least pulling your leg. "Does everything for mail but lick the stamps. No frustration...easy to use." Good grief! Do the folks at DHA Systems think that we are all part of that group that is "born every minute?" Even the documentation looks like a put on...165½ x 5½ pages. That's not enough for a small game!

First Impressions Aren't Always Gospel

Those were my first impressions and believe me they didn't last long! The program does just as advertised and then some. I'm not used to getting this kind of package at that kind of price. This is a lot of software in a small package. FastPak Mail System will handle most of your business needs from the individual letter to a mass mailing of personalized form letters. FastPak doesn't need a lot of documentation because it is so easy to run. Fire it up and go to work--right now. The docs should be read because there will come a time when you will need to refer to

continued on page 148

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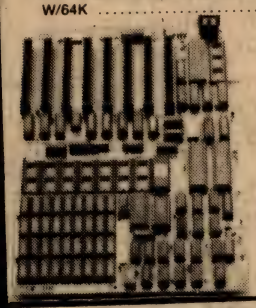

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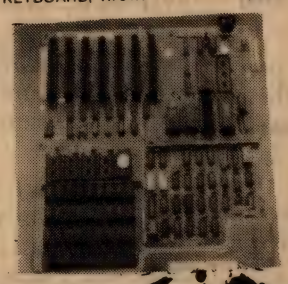

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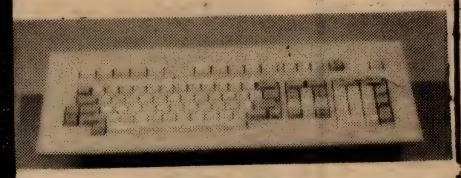

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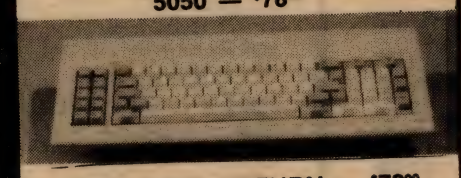

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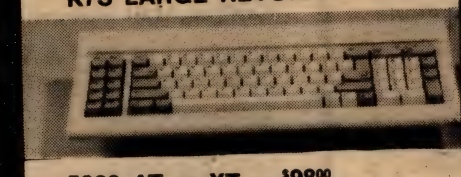

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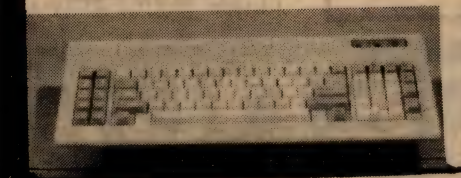

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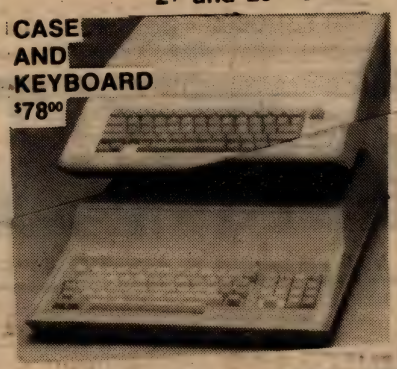

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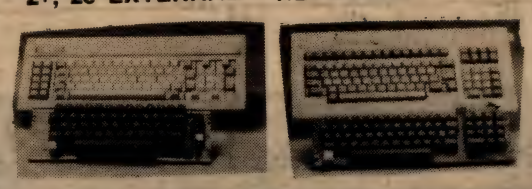

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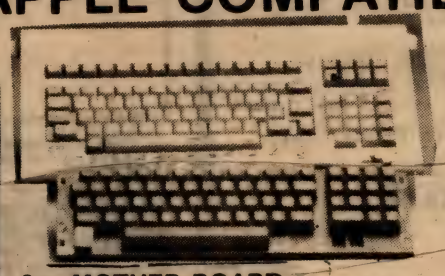

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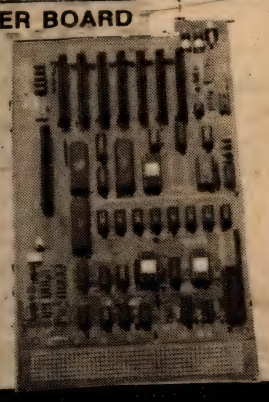

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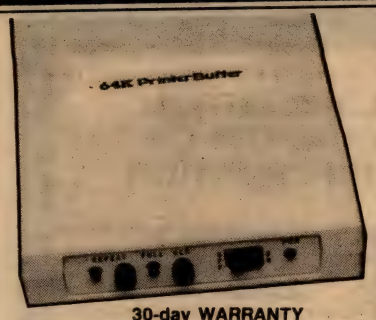

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Tandy Topics continued from page 146

the merge or sort section and it will be nice if you at least know where to look.

The package will work with many popular word processors. The documentation for the MERGE procedure is short but covers the application very well so you should have no trouble. The SORT feature is a separate program and runs independently of MAIL. Records can be sorted by last name, company name, zip or by a reference code established by the user. SORT will handle up to 4000 records without assistance. Larger than that will require KEY sorting.

COMBINE allows the user to add one file to another. PRINTREF prints the master file, it is currently sorted, in a shortened format with the record number, reference code, last name and the phone number. SELECT allows certain records to be accessed from the master file. This can be by zip, state or combinations of reference codes. The DUPE program will display duplicate records for possible deletion.

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Records can be printed in several formats. Labels from 1 to 4 wide, Master listings, a reference list (see above) and user defined printouts using the MERGE feature. Each of the listings is easy to produce on your printer.

At this point I have yet to find a problem with this fine product. It is not even copy protected (Thank you DHA). I for one am tired of copy protected software and if there is a choice I will buy another product over one that is copy protected, even if it does mean getting a little less, or more, than I started out to purchase. It runs well and its fast. The SORT is faster than I expected. The documentation that I thought was short is definitely long enough and very well written. There is a supplementary READ.ME file for late updates to the docs. You will seldom need the doc's unless you are getting fancy with the MERGE or SORT features. DHA provides a full year of free upgrades and as much telephone support as is necessary for the individual user to get off the ground and running.

FastPak is available for almost any computer. IBM-PC,AT and clones, MS-DOS, Victor 9000, DEC Rainbow, etc. CPM/80, Kaypro, Apple, Zerox and over 100 types of terminals. Conversion utilities are available to convert your old list to FastPak Mail--no retyping. Very little training of office workers would be needed to set this program to work. If the rest of DHA's business packages are written and priced as well as this one, they will do a lot of business.

I can see a lot of applications for this program in almost any business. In direct mailings it can be a tremendous asset. It would be easy to bypass this product because of the price...its *low*! We get accustomed to 3 figure prices for software and tend to be wary of packages that cost less for fear that they are "cheap." FastPak Mail System costs less but it definitely is not "cheap." Try it if you need a mail package for your MS-DOS or CPM based computer. You will like it!

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Comdex Wrap-up continued from page 63

dent. Dr. and Mrs. Alpert retained their positions as president and vice president, respectively.

Also announced at the breakfast were Tecmar's newest products, MegaFunction and CD Massfile. MegaFunction is an add-on card for the IBM PC and compatibles which adds 1.25 megabytes of memory, a RAM disk with auxiliary power supply, a parallel printer port, serial port, and clock/calendar. Included with the hardware are 24 business and personal software programs. Suggested retail price is $895.

CD Massfile is a read only data retrieval system using compact disk technology. The optical disks can hold up to 550 megabytes of data, or approximately as much as 1600 IBM-type double-sided double density floppy disks. Using the Sony-Phillips standard for data organization (most commonly used standard on Compact Digital Audio discs), vast libraries of information occupy little space. Placement of dictionaries, encyclopedias, catalogs, manuals, historical information and other archival and reference data on such disks cold make the information easily accessible. High cost of mastering the data disks makes storage of dynamic information unlikely, however.

CD Massfile's suggested retail price is $1695. Controller cards (different for each personal computer) retail for $295 and include software to search databases. The controller cards are capable of driving two readers, so databases as large as 1.1 gigabytes are possible.

Cauzin Shows Input Device For Apple II, Macintosh And IBM

Cauzin Systems, Inc. demonstrated the Softstrip media distribution system at both their booth and Apple Computer's booth. The system uses their proprietary software running on one of three computers and a laser or dot matrix printer to create black-and-white strips of data. A 9 1/2 by 5/8 inch strip created with a laser printer contains 3K of data. Up to five strips will fit on a standard 8 1/2 by 11 inch page.

With a $200 (approximate cost) reader, the information can be quickly re-entered into IBM, Apple II and Macintosh computers. Operated through a serial or cassette port, the reader can transfer data at up to 4800 baud, but 1500 baud is typical.

According to Cauzin, several computer magazines will feature SoftStrip versions of programs that will allow readers to enter software without having to key it in via a keyboard. Cauzin also claims that several book publishers are going to be using SoftStrips to simplify entering programs from computer books.

Apple II Emulator For Macintosh 512

"II in a Mac," from Computer:Applications, Inc. allows a 512K Macintosh computer to run Apple II software. Complete with a built-in communications package, this Apple II emulator turns the Macintosh into a four drive, joystick controllable Apple II. While keeping the ease of use features of a Macintosh, pull-down menus and desk accessories, it pretends to run Apple DOS 3.3 or ProDOS and programs that function in those environments.

Programs can be transferred into the Macintosh using serial transfer through the RS232C cable or through a modem by phone. Communications software for both Apple II and Macintosh are included. In addition, Computer:Applications, Inc. is offering 10 Macintosh diskettes containing over 13,000 public domain Apple programs. Asking $9.95 per disk, they claim each Macintosh diskette is the equivalent of two full Apple II disks.

Providing easy access to the thousands of Apple II programs available, the company claims an operating speed of 35-40% of the speed on an Apple II. II in a Mac retailed for $49.95 until Christmas. According to their Comdex representative, a $20 price increase is projected for 1986.

Atari Counters Lack of Software Charges Against 520ST

Atari Corp. laid to rest complaints of lack of software and hardware support for its 520ST by inviting vendors to show their products in Atari's booth. More than twenty five vendors gathered to demonstrate their products. Atari also distributed a list of products currently available or under development.

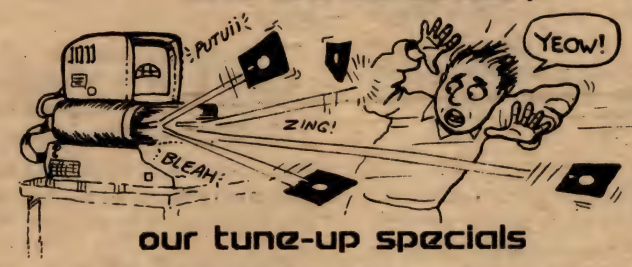
Several prominent software companies including Antic, Batteries Included, Infocom, Activision, Mark of the Unicorn and Tellarium have products available for immediate shipment. Many other companies have products in development.

Though some developers were showing already popular games converted to run on the 520ST, there were also programming languages and business software being demonstrated. Versions of Modula-2, BASIC, LOGO, Forth, and C are now available according to Atari. Several word processors, terminal packages, utility packages and accounting software are also available.

Many popular programs being offered on the computers are being converted to run on the ST. These include Home-Pak, DB Master, Final Word, Typing Tutor, Lattice C,

continued on page 153

disk drive acting irregular, intermittent, and uninterested?



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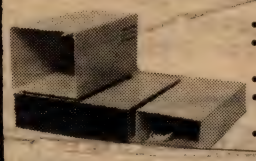

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Computer Interface for Home Electrical Functions

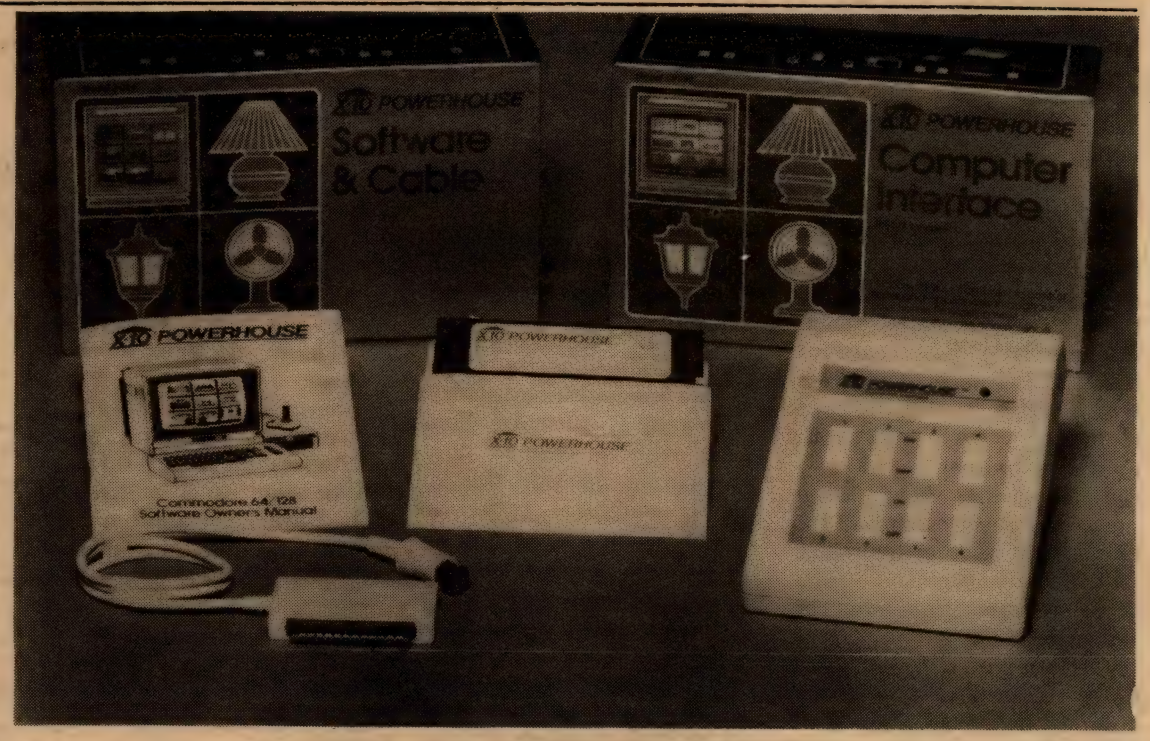
X-10 (USA) Inc., has unveiled "Powerhouse," a computer interface that enables Apple and Commodore computers to control automatically all electrical devices in a home, store, or office.

The company claims that the interface gives computers their first truly useful application in the typical home by making possible the automatic control of lights, appliances, heating and air conditioning, and other electrically operated apparatus. It can also be used with earlier X-10 poroducts.

"The home computer finally has a practical role," said Peter A. Lesser, X-10's president. "We can now help anyone improve home security, add remote control convenience, and save energy dollars--ad do it all simply," he said.

Powerhouse, the size of a paperback book, is supplied with software on diskette and a computer interface cable. It was available in computer and electronics stores in September at a suggested list price of $150.

Powerhouse software uses colorful graphic menus, making set-up and programming of a home control system fast and easy. It permits full 7-day programming so that day-to-day schedules can be, but not need be, different. This feature is very effective in home security and energy-saving applications. The interface also permits instantaneous remote control of lamps and appliances directly with the computer joystick, keyboard or mouse.



X-10 Powerhorse Controller for Commodore 64/128

The software graphically displays each room in the house and tells the user how to select the lights, TV's, stereos, air conditioning and heating systems, and any other electrical devices to be controlled. Menus depict front and rear views of the building so outdoor lighting or an automatic lawn sprinkler can also be programmed. The brightness of any light can be set to a selected level.

After the user selects devices and their timing schedules, the computer loads the information into Powerhouse's memory. Then Powerhouse may be disconnected from the computer, and the computer can be turned off or used for other applications. Powerhouse will continue to run the entire control system according to the stored program. It uses a 9V battery to protect its electronic memory in the event of a power outage or when someone unplugs the unit to move it to another location.

Powerhouse, which plugs into any convenient wall outlet, works by sending signals over the regular home AC wiring to X-10 remote control modules anywhere in the home. Like earlier X-10 home control products, it requires no additional home wiring and is quickly installed by homeowners. Lamps and appliances, plugged into control modules (which in turn are plugged into wall outlets), are controlled by Powerhouse signals. As an added convenience, the Powerhouse console has rocker switches which provide instant manual ON-OFF control of eight lights or appliances.

In addition to plug-in modules, X-10 makes wall switches and outlets that can replace normal home fixtures. The X-10 products, all U.L. listed, look and work like ordinary fixtures, except that they also respond to Powerhouse commands. X-10 modules and accessories are readily available from Sears, Roebuck and Radio Shack.

For additional information contact X-10 (USA) Inc., 185A Legrand Avenue, Northvale, NJ 07647.

Mention that you read about it in *Computer Shopper*. ●

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The 2nd generation in optical mice. If you believe that mechanical mice are inherently less reliable than optical mice because of their moving parts wear but have been disappointed by the "hopping" and pad fading of Mouse Systems and Summagraphics mice, you may be interested to learn of the 2nd generation of non-chromatic optical mice. These new mice are made more simply for higher MTBF. There is no spectroanalysis of dye vats in the pad manufacture, no worry about the pads fading near a sunny window, no concern for color sensitive photodetectors or their analog circuitry drifting or failing. The Crystal Mouse does not see multi-colored lines in X and Y but sees 2 reflections from 2 depths of imbedded metal strips. Available now in 2 button and 4 switch versions, with hidden power supply, optical pad, manual, and TTL to RS-232 adapter plug complete. Single quantity sample price $195. Drastic OEM quantity discounts available. Sorry, at this time we can only ship the Crystal Mouse to qualified OEM's.

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This new bar code reader with a keyboard emulator for the PC, XT or AT plugs between the keyboard and the CPU, so it doesn't eat up another valuable slot. It scans in either direction, requires no external power supply, gives audible and visible confirmation of correct readings. Perhaps the easiest and most straight forward solution to problems of managing inventory, order entry, work-in-progress, document location or small business point-of-sale systems. Quantity one price: $295. OEM and system house inquiries welcomed.

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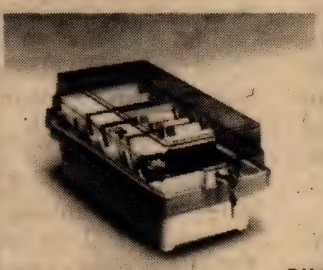

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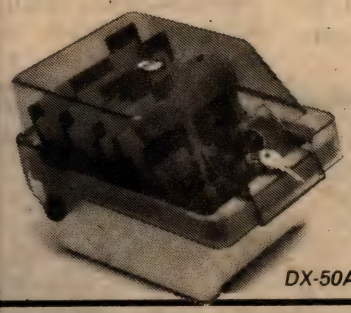

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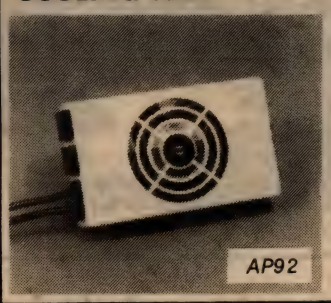

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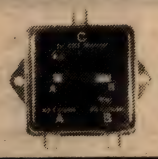

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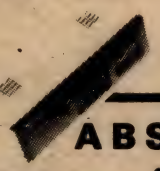

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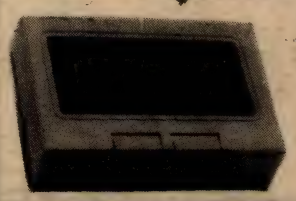

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Tymac Announces "The Connection"™

A Fully Intelligent Parallel Printer Interface For Commodore® Computers

TYMAC, Franklin, New Jersey, announces the availability of "The Connection"™ a fully-intelligent parallel printer interface for Commodore computers, including Commodore 64™, Commodore 128™, Plus/4™, Commodore 16™, and VIC 20® . "The Connection" simply plugs into the serial disk port to enhance the Commodore's printing capabilities and to ultimately produce refined, finished documents.

TYMAC has applied state of the art computer technology to equip "The Connection" with two modes: an mulation mode (imitates Commodore 1525 printers) and a transparent mode (information goes straight through - no interpretation).

TYMAC's "The Connection" will translate Commodore ASCII to standard ASCII for clear, easy-to-read text in either full graphic characters or equivalent representations. This unequalled parallel printer interface supports all of the standard commands for flexibility in printing, including column tabbing, dot tabbing, graphic repeat, dot addressable graphics, and more. In addition, "The Connection" features a 2K buffer, an exclusive feature offered by no other printer interface on the market. A full printer self-test, LED status indicator, printer reset switch, skip over perf, margin set, and programmable line length are additional options that allow the user to print according to his own specifications.

Tymac Parallel Interface for Commodore

"The Connection" is compatible with any parallel printer that is equipped with a standard Centronics® interface, including Star, Riteman, Smith-Corona/Epson, Panasonic, BMC-80, Mannesman Tally, Olympia/Okidata, Canon/C. Itoh, NEC/Seikosha, Gorilla Banana/and Universal. For graphics, each printer requires a special version of "The Connection" to take full advantage of its unique features. "The Connection" has a suggested retail price of $69.95 (non-Epson) and $73.95 (Epson).

For further information contact Tymac® Controls Corporation, 127 Main Street, Franklin, NJ 07416. 201-827-4050.

Mention that you read about it in *Computer Shopper*. ●

BASIC Toolkit For Commodore 64/128

Owners of the nation's most popular home computer now have fast, powerful programming ability at their fingertips with Programmers' BASIC Toolkit by Epyx.

The BASIC Toolkit gives Commodore 64 and 128 programmers something they've long wanted: assembly language power and speed using simple BASIC commands.

More than 100 new BASIC commands allow Commodore owners to add high-speed assembly language operations to their application programs. The result: enhanced game design, computer animation, business graphics, and much more for the Commodore owner.

"We at Epyx believe many software companies have overlooked the fact that Commodore owners often want to use their computers for programming and design functions as well as business, home productivity or home entertainment applications," says Marketing Vice President Robert Botch. "The Programmrs' BASIC Toolkit addresses a critical need for more than three million Commodore households. What's more, it's the fastest, most powerful programming aid available for the Commodore 64 and 128."

The BASIC Toolkit's Mac-like Sprite and Font editors add convenience, speed and power to Commodore 64 BASIC and also work with the Commodore 128.

The Toolkit is more than an enhancement of Commodore BASIC, however. It boosts the Commodore operating system as well, with features such as a Directory Listing command, straightforward Disk Command Syntax, and a LOAD/SAVE function for graphics, sprites and character sets. The Epyx BASIC Toolkit even allows users to print disk catalogs, text files and program listings easily and quickly in BASIC language.

Graphics are a breeze with Programmers' BASIC Toolkit. Special commands allow development of professional-quality application programs for home or business-use graphics. For programmers with artistic talent, the Toolkit

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BASIC Toolkit
continued from page 152

makes it possible to create high-quality graphics like those in many commercially available games.

Simple commands in the Toolkit enable Commodore owners to easily incorporate computer joystick functions into their programs. Additional commands also provide for sophisticated printing utilities.

A Vorpal Fast Loader is built into the BASIC Toolkit. This technique, developed exclusively by Epyx, is the most rapid disk-loading enhancement available for Commodore 1541 and 1571 disk drives.

Each new command in the BASIC Toolkit is fully documented in a complete Toolkit manual which includes demo and utility programs plus a handy Command Reference Card.

No Commodore programmer should program without Programmers' BASIC Toolkit by Epyx. It's available now from retailers of computer software and accessories nationwide at an affordable price range of $34.95 to $44.95.

For additional information contact Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089.

Mention that you read about it in *Computer Shopper*. ●

Comdex Wrap-up
continued from page 149

Flight Simulator, Jet, Silent Service, Fahrenheit 451, Amazon, Ultima II, Hacker and all of Infocom's games.

Other interesting products projected for release are a CP/M emulator; a computer-aided design business graphics, typesetting combination; RAM disk programs; print spooler; MIDI interface driver; a typesetting and page layout processor; integrated software packages and an EPROM burner.

Atari plans to release a 10 megabyte hard disk drive, a double-sided 3.5 inch floppy drive, a dot matrix printer and a daisy wheel printer. According to Atari most parallel printers can be tied into the bi-directional parallel port and most serial modems can use the RS232C port.

Commodore Presence Minimal At Comdex

Commodore Business Machines pulled out of their booth leaving a very visable hole. Replacing the scheduled booth appearance with a press conference and hospitality suite may have been a cost-cutting measure reflecting the company's substantial third quarter losses. Commodore has plans to make a major showing at the World of Commodore III show in Toronto and austerity measures within the company may have forced them to frugality in Las Vegas. With many Commodore products being marketed through major chain stores, the company may feel it has little need to solicit vendors at a computer dealer's exposition.

Only a few vendors were showing Amiga dependent products. Okidata, Inc. ran demonstrations for its Okimate 20 Amiga compatible color printer. Tecmar, Inc. manufacturers of expansion products for IBM PC and compatibles, Macintosh and Amiga computers did not emphasize any of their Amiga products at their press breakfast, however an Amiga running their hard disk system was in evidence in the Tecmar booth. Philon Inc. was showing their computer language compilers which include some for the Amiga.

An interesting note. Atari was one of the few booths with an Amiga. A comparison of the Amiga's renowned checkered, bouncing ball was being run on the Amiga, Atari 520ST and the Apple Macintosh. The Macintosh appeared to run slowest--Atari, the fastest. Though an amusing display, probably not a fair comparison. Since all three machines use different operating systems and the program was probably done differently on each one, the exercise proved only that all three computers could be programmed to perform similar functions.

Butler In A Box

One interesting item shown at the convention wasn't strictly a computer or peripheral device. Neither was it a software product. Butler in a Box from Mastervoice, Ltd. is a talking, voice-recognition, auto-dial speakerphone, smart clock, infared detector and home control device.

Developed by magician Gus Searcy and programmer Franz Kavan, the Butler was originally named Sidney, though now its name is user assigned. The butler recognzies four voices speaking up to 24 commands each. It remembers 15 phone numbers for each voice it recognizes. Initially, the Butler must be taught the voices and commands to which it should respond. In addition, its responses can be changed by "recording" another voice.

Using a program called AIR (Artificial Intelligent Recognizer), it analyzes commands or other input and responds accordingly.

It can recognize a command to dial a phone number, place the call, turn the speakerphone on, recognize a command to

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The MTBASIC package includes all the necessary software to run in interpreter or compiler mode, an installation program (so any system can use windows), demonstration programs, and a comprehensive manual.

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MTBASIC is available for CP/M, MS-DOS, and PC-DOS systems for $49.95. MTBASIC with 8087 support is available for MS-DOS for $79.95. Shipping is $3.50 ($10.00 overseas). MD residents add 5% sales tax. MC, Visa, checks and COD accepted.

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Comdex Wrap-up continued from page 153

hang up and do so. It also detects a busy signal and disconnects.

Using commonly available modules, the Butler can be set up to control any appliance. Commands for on, off, bright and dim are typical. A command to activate or deactivate all modules is also available. Sixty time-controlled lines can also be set to control any of the modules.

An infrared motion detector in it is used as an intruder sensor. Before departing the area, the owner must "teach" it how to respond to an intruder. As demonstrated, it is set via a vocal command on leaving the room. Any movement in the room triggers the box to request indentification. The voice recognition area then waits for the response it's been "taught" to expect. If the response doesn't come within a user specified time frame, the Box will take whatever action it "learned" earlier. For instance, if a correct voice doesn't give a correct response within 30 seconds, it would flash all the lights on and off, call the intruder nasty names and turn on the building's alarm system, if "trained" do so beforehand.

The most difficult aspect of the Butler's use is learning to "teach" it and that isn't very difficult. Designed for use by non-computerists, the initial set-up (as demonstrated for the press) seemed simple enough.

The Butler is a multi-function product whose many capabilities will undoubtedly find a home quickly. While an interesting play toy for the average user the Butler could give added independence to the physically impaired. Its voice control activation would make it indispensable to paraplegics and quadriplegics.

Suggested list price $1195.

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(215) 431-9100

Mastervoice Ltd.
5067 Cumberland Drive
Cypress, CA 90630
(714) 220-2415

Inside Commodore continued from page 63

memory location other than $C000. That seems like a simple thing to do using an ML monitor, but I have tried to do it and then print (with) another program which uses the $C000 area and failed. I am using the HES MON monitor which has a function called transfer that moves a block of memory from one location to another. I have no trouble transferring the loader, but the program I am trying to print still doesn't print. Is there a definite area that I would have to transfer it to for it to work? I have a feeling that one program is wiping out the other or something....

Jim Ashby
Palos Verdes Estates, CA

Jim's problem with the printer driver points out a common source of problems when using more than one ML program at once in a C-64. Many utility programs like to find their home somewhere in the ram buffer at $C000-CFFF, safe from BASIC's intervention (including our parallel printer driver). But since it's such a popular place (like the cassette buffer at $033C), programs from different sources tend to clober one another.

It seems simple enough to move a program out of the way of another so they don't trash each other. But, as Jim indicates in his letter, that's a task that's not quite as simple as it first seems. Moving program code to a new area of RAM (using a "transfer" command) is only one step in the relocation process. You also have to adjust all absolute memory references within the program to reflect its new loca-

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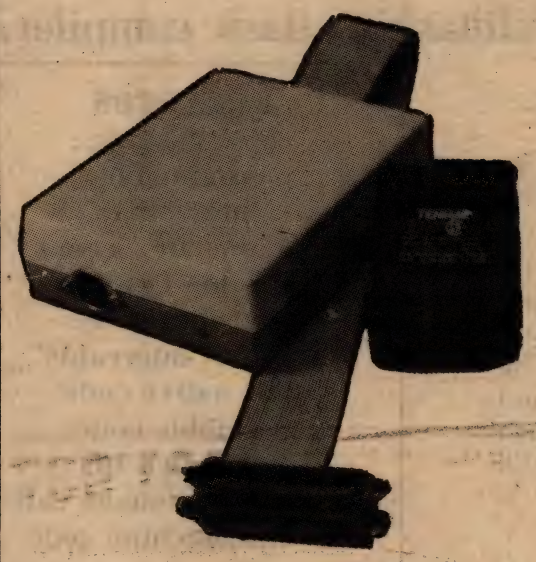

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Inside Commodore continued from page 154

tion. That takes some work, as we shall see.

Relocating ML code with a monitor program is not necessarily the easiest thing in the world. You have to be experienced both in assembly language and monitor usage. But, once you get onto the process, it becomes a fairly trivial matter to relocate most ML programs that are 1K in length or less. I have sucessfully relocated such programs as "Micromon-64," "TurboDisk," "Scroller," and other programs which have appeared in magazines like *COMPUTE!'s Gazette* and *Transactor*. The way programs have been written largely determines how difficult they are to relocate.

Actually, the "easiest" way to relocate a program is to reassemble the original source code to originate at a different address (one that you know is safe) and let the assembler do the work for you automatically. Unfortunately, most ML programs that you run across for the C-64 in magazines (with the exception of *Transactor*), don't have the source code with them (our printer driver, ahem, is a notable exception).

Get A Relocating Monitor

Although you can use almost any ML monitor to relocate programs, some are better for the job than others. I recommend strongly that you get a monitor that has the "New Locator" command, in addition to a "Transfer" command. The "New Locator" is a very big help in the relocation process programs. Without it you have the mundane task of changing every three byte instruction by hand. You should also get a monitor that prints the ASCII/PETSCII equivalents of hex bytes when it does its memory dumps. This is a big help when you start disassembling programs and trying to identify ASCII data areas.

Unfortunately, while Jim Butterfield's "Supermon-64" is an excellent learning tool, it doesn't have these features. Bill Yee's "Micromon-64" does (and is the monitor I use most often). The monitor that comes with the Commodore Macro Assembler Development System ("MADS" for short) also has these features, but it has some bugs along with them. You can use it for the purposes of this article, but it falls short as a general purpose monitor. I think "HESMON" has the New Locator and it may dump ASCII, but I'm not sure.

I'll be using Micromon-64 (my favorite) in the examples here. If you're using something else, observe what's happening

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Business Software continued from page 64

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Commodore Business Machines

Commodore Business machines also is shipping six software packages for the Amiga Personal Computer.

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"We are particularly happy to have been able to deliver these essential productivity packages and programming tools to the public so soon after the shipping of the Amiga," said Frank Leonardi, vice president of sales for Commodore Business Machines. "Most new computer users must wait close to a year before there is a viable assortment of software packages that take advantage of their machines' new technologies."

More than 900 developers have received Amiga developers kits, he added. Approximately 50 software programs were shipped by Christmas. Nearly 100 third party products are expected to be ready for shipment by the end of February, 1986. ●

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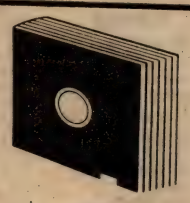

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Inside Commodore continued from page 156

closely, because you'll have to translate to your particular program.

Doing the Relocation

We'll be relocating the C64 version of our printer driver (v. 2.2) from $C000 to $9000. This will get it out of the buffer area and put it in the top of free RAM, where we can set the top of memory pointer lower and protect it from BASIC. This leaves the $C000 buffer open for other programs.

Load a copy of the printer driver into $C000 buy RUNning the BASIC loader program (but don't SYS to the driver yet). Now we've got the code at $C000-C200 intact. Next, SYS to your monitor program.

Next, you will transfer the code, and using the Relocator command, adjust all the instructions. Here's the Micromon commands to do it:

```
.T C000 C200 9000                ;(This move the code to $9000-9200)
.N 9000 9048 D000 C000 CFFF      ;(This adjusts the 3 byte instructions)
.N 9049 906C D000 C000 CFFF W    ;(Adjusts the word tables)
.N 906D 91AC D000 C000 CFFF      ;(Adjust instructions)
.N 91B0 91EE D000 C000 CFFF      ;    "          "
.N 91FC 9200 D000 C000 CFFF      ;    "          "
```

This saves an object file that can be LOADed with a "Load filename, 8,1." After loading the file, "POKE 55,0" and POKE 56,144." Then do a "NEW." The printer driver will be safely sealed up in the top of RAM until you power off. Finally, you are ready to "SYS 9*4096" and turn the driver on. If you encounter errors, try it again. I've double checked all the above codes.

There's a lot more that can be said about relocating ML code. If there's enough interest, we might explore the topic later in a little more depth. Write and let me know if you would like to see a series of articles on the subject.

C-128 Clouds On the Horizon?

Most of you who have followed this column at all know that I am quite enthusiastic about the C-128. I have rambled on about how great this thing is since I first heard about it over a year ago. I'm excited not just because it's such a nice computer in its own right, but because Commodore really corrected some of their dumb mistakes they made with the Plus/4 and C-16 (my apologies to the respective owners).

They made sure the new machine was compatible with the huge base of C-64 software, and then they added CP/M to ensure that it had a credible base of (admittedly mature) business software. If that wasn't enough, they then corrected the old hardware problems of less than 80 columns display and slow disk drive. Finally, they added a new "blow out" version of BASIC, function keys, numeric pad, RGB video, 512K RAM expansion, and all kinds of other nonsense. Then they position it between the C-64 and the Apple IIc, so it undercuts the Apple's price, but doesn't totally kill off the C-64 until they can get rid of their inventory.

I said quite some time ago, in order to be successful, the C-128 would have to have a timely introduction to be established. Commodore waited several months to get the C-128 to market. Maybe the C-128 is just 6 months too late in being the next C-64 (cheap computer for masses). At this point in time, the C-128 is indeed a good value, but on the horizon is a whole flock of new competitors who are threatening to make sure that computers like the C-128 have no chance of being accepted outside range of Commodore enthusiasts. (And they may take a lot of wind out of Apple's sail...err...sales....too!)

Clone Wars Ahead

I'm referring, of course, to the impending flood of IBM-PC clones that are about to be dumped on the market. During the end of 1985, IBM dumped the PCjr for a mere pitance (compared to its original price) and Tandy cut the 1000 price way low. Neither of those machines are really exceptional values in themselves, but they are just the first volleys of the "PC-Clone Wars" of 1986. You see, IBM is planning on dropping their regular PC in 1986 and replacing it with a new "PC 2." When that happens, all PC-clones will become surplus items and the floodgates will be opened!

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If you've been reading any general interest computer magazines in the past few months (like the *Computer Shopper* you are now holding), you've probably seen the PC-Clone ads that appear on almost every page. Well, expect to see even more of them in the year to come.

The way that IBM-PC clones are dropping in price, it is hard to imagine that they won't make a tremendous impact on the whole computer scene. For example, let's do a little price comparison between the C-128 and a typical PC clone recently advertised in the *Computer Shopper*:

	C-128	PC-Clone (256K)
CPU box/keyboard	$299.00	$995.00
Two disk drives	$498.00 (2@$249.00 ea.)	Included
512K RAM	$200.00 (est.?)	$30.00 additonal chips
RGB Monitor	$250.00	Included
TOTAL COST	$1247.00	$1025.00

Ulp! when you begin to expand the C-128, you can see that it shoots up in price dramatically. Now, you and I (as Commodore enthusiasts) may not care one bit about IBM compatibility. We may feel that the C-128 is a superior machine and worth the extra dollars in a "high end" configuration like this. But that's not the point.

The point is, does Commodore's potential C-128 market feel the same way? Do the millions of small business owners and non-computer literate potential users care about IBM compatibility? The answer is, "You bet they do!" Most of them still consider Commodore the computer they see at K-Mart when they go Christmas toy shopping for their kids. So, which do you think they are going to buy when they are looking for a "serious business machine?" A C-128 "Comedy-toy" or a "real IBM-compatible" PC (made in Taiwan, probably) for less money?

Commodore to the Rescue?

Commodore, far from being out of touch with the market, has forseen some of these happenings and has prepared a tentative response. Unfortunately, the C-128 isn't a big part of it. Commodore's strategy is now centering on the Amiga. That's one reason why they made sure the Amiga had some kind of IBM compatibility. Without it, the Amiga would be lost in the sea of PC clones surrounding it. I'm afraid the C-128 may get left as an "orphan," a leftover from the pre-Amiga days. I don't think it will go out of production anytime soon, but it's hard to imagine it ever achieving the popularity of the C-64.

Of course, if Commodore can cut the price of the C-128 enough, it may still find a niche at the low end of the market. With enough price cutting it might even keep the low end all to itself. But with price cuts come lower profit margins, and Commodore has bled enough red ink the past year to almost sink the ship. I hate to sound negative, but I'm just reporting what I honestly see on the horizon.

There are two possibilities, though, that might happen that will leave Commodore sailing high. The first is if they make a dramatic price reduction on the Amiga. If you could get an Amiga for the price of the C-128 system we looked at, it would be a bargain few could resist! Even IBM's PC2 would have a hard time matching the computing power. (Plus you would still have IBM compatibility.)

If the whole world goes nuts over the PC (which is a possibility) and it becomes an unshakable monolith (which it almost is), the Commodore has one final ace in the hole; their own PC clones; the PC-10 and PC-20. No other "low end" manufacturer has PC-clones like these already in production. Commodore just might decide to become the low end power broker through peddling their own clones at bargain basement prices. They might even sell them through the discount retail chains they already have lined up. Stranger things have happened and more stranger things will happen in the next year! Stay tuned for more. ●

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comprehensive reference book covers all the standard COMAL instructions. It will undoubtedly soon be supplemented by a second book treating the USE packages, or revised to include them. This, by the way, may become a difficult process. We suspect the development of new USE packages will be a very dynamic industry.

Sprite Generator

We believe that you gain skill language only if you get involved in its use. For that reason we are introducing quickly a useful program for sprite development. It permits relatively simple "drawing" of a sprite figure, then easy capture to print or diskette. Although the routine parallels the use of binary numbers it gives the user a neater picture of the input figure during the preparation stage. The program is listed below. We'll discuss its contents in the following paragraphs. Initially we'll look at the broad aspects of the program, and its use. You can use it without too much concern for the mitty-gritty details, as you are prompted while the routine runs. However, the more technical details are also analyzed.

continued on page 159

```
0010 // sprites by tymon's method
0020 //
0030 // file is tymon's sprites.cpgm
0040 // A SPRITE DEVELOPMENT ROUTINE
0050 //
0060 // convert 0/1 strings to sprite values
0070 //
0080 // s() is a two-dimensional matrix which will hold the sprite numbers
0090 //
0100 // ar$ is a string of characters corresponding to the current data statemen
0110 //
0120 DIM s(21,3), ar$ OF 24
0130 PAGE
0140 //
0150 FOR ln:=1 TO 21 DO
0160   READ ar$
0170   FOR by:=1 TO 3 DO
0180     PRINT AT 1,39: "*"
0190     s(ln,by):=0
0200     FOR bi:=1 TO 8 DO
0210       k:=8-bi
0220       // next two statements apply only if blanks or graphics occur in DATA
0230       //
0240       // allows use of spaces in DATA statements
0250       //
0260       IF ar$(1:1)=" " THEN ar$(1:1):="0"
0270       //
0280       // allows use of graphics in DATA statements
0290       //
0300       IF ar$(1:1)="+" THEN ar$(1:1):="1"
0310       //
0320       // a dump of p1 through p7 displays intermediate values for analysis
0330       //
0340       // converts leading character to numeric value
0350       //
0360       p1:=VAL(ar$(1:1))
0370       p2:=2^k
0380       p3:=p1*p2
0390       s(ln,by):=s(ln,by)+p3
0400       p4:=s(ln,by)
0410       p5:=(by-1)*8
0420       p6:=bi+p5
0430       p7:=24-p6
0440       //
0450       // assigns to ar$ the characters to the right of first character
0460       //
0470       ar$:=ar$(2:p7+1)
0480       PRINT AT 1,39: " "
0490     ENDFOR bi
0500   ENDFOR by
0510 ENDFOR ln
```

Program continued next page

Comal Corner
continued from page 158

Tymon

There are, as you can see, 21 DATA lines in the program. The entires between the quotation marks can be either 0s or 1s. The program as given will read these, and convert each sequence of 8 digits to a number usable for sprite generation. To illustrate the process we have included (with extended opposition from Melody) a portrait of the "Junior" author. (She doesn't like that term either!)

As you undoubtedly notice the picture produced by this method is not easily recognizable. There should be an easier way.

Actually, there is. For starters, if we input a simple line to convert a " " to a "0", then we can use spaces in the data statement wherever 0s currently appear. Statement number 250 performs this function. To see the improvement replace all the zeros with blanks, using the CHANGE statement. Now run the program once more.

If everything goes well the same numbers should be generated as before. We dumped the DATA statements to print with a control P, and you can easily see improvement in the displayed figure. However, even here, we may find it possible to make additional worthwhile changes.

```
0390 DATA "00000000011111110000000"
0400 DATA "00000001111011111000000"
0410 DATA "00000011111011111000000"
0420 DATA "00000111100000001111000"
0430 DATA "00001100000000001100000"
0440 DATA "00001100000000001100000"
0450 DATA "00001100000000001100000"
0460 DATA "00001100110011001100000"
0470 DATA "00001100000000001100000"
0480 DATA "00001100001100001100000"
0490 DATA "00001100000000001100000"
0500 DATA "00001100111111001100000"
0510 DATA "00001101000000101100000"
0520 DATA "01100110100000101100110"
0530 DATA "01100110011111001100110"
0540 DATA "01100110000000001100110"
0550 DATA "01111111000000011111110"
0560 DATA "01111101000000010111110"
0570 DATA "00110001000000100011100"
0580 DATA "00011000100001000001100"
0590 DATA "00000000000110000000000"

0390 DATA "      111111      "
0400 DATA "    1111 11111    "
0410 DATA "   111111 11111   "
0420 DATA "  1111     1111  "
0430 DATA "  11         11  "
0440 DATA "  11         11  "
0450 DATA "  11         11  "
0460 DATA "  11  11  11 11  "
0470 DATA "  11         11  "
0480 DATA "  11    11   11  "
0490 DATA "  11         11  "
0500 DATA "  11  111111 11  "
0510 DATA "  11 1      1 11 "
0520 DATA " 11  11 1    1 11  11 "
0530 DATA " 11  11  111111  11  11 "
0540 DATA " 11  11        11  11 "
0550 DATA " 1111111       1111111 "
0560 DATA " 11111 1       1 11111 "
0570 DATA "  111   1     1   111  "
0580 DATA "   11    1   1    11   "
0590 DATA "          11           "
```

A second statement, line 300, also enhances the process. This statement, if active, allows you to draw between the quotation marks, using the graphic symbol generated by the Commodore Key and the + key. This is displayed as a small checkerboard on the screen. If dumped to the printer it may differ, depending on the printer used. Of course, any other graphic symbol can be substituted. At this point re-do our portrait using the graphic symbol. The result will more nearly correspond to the final sprite which will eventually glorify (Melody's choice of words) your screen.

The numeric values generated may be examined on the screen, or may be saved on disk or in printed form. To use the hardcopy output option, merely input "lp" when requested. Subsequent print statements will be directed to the printer. The numbers may be saved to a disk using the

continued on page 160

Program
continued from page 158

```
0520 //
0530 PAGE
0540 INPUT "input ds to print to screen, lp to print hardcopy ": wh$
0550 //
0560 PAGE
0570 SELECT OUTPUT wh$+":"
0580 FOR i:=1 TO 21 DO
0590   FOR j:=1 TO 3 DO
0600     IF wh$="lp" THEN PRINT TAB(10*j);s(i,j);
0610     IF wh$="ds" THEN PRINT AT i,15*(j-1): s(i,j)
0620   ENDFOR j
0630   PRINT
0640 ENDFOR i
0650 pause
0660 SELECT OUTPUT "ds:"
0670 PAGE
0680 //
0690 //
0700 INPUT "input disk to save numbers to sequential file, else input no ": ds
0710 IF ds(1:1)="d" THEN
0720   outdisk(s(,))
0730 ELSE
0740   NULL
0750 ENDIF
0760 //
0770 //     00000000011111111122222
0780 //     12345678901234567890123 4
0790 //
0800 DATA "00000000000000000000000"
0810 DATA "00000000000000000000000"
0820 DATA "00000000000000000000000"
0830 DATA "00000000000000000000000"
0840 DATA "00000000000000000000000"
0850 DATA "00000000000000000000000"
0860 DATA "00000000000000000000000"
0870 DATA "00000000000000000000000"
0880 DATA "00000000000000000000000"
0890 DATA "00000000000000000000000"
0900 DATA "00000000000000000000000"
0910 DATA "00000000000000000000000"
0920 DATA "00000000000000000000000"
0930 DATA "00000000000000000000000"
0940 DATA "00000000000000000000000"
0950 DATA "00000000000000000000000"
0960 DATA "00000000000000000000000"
0970 DATA "00000000000000000000000"
0980 DATA "00000000000000000000000"
0990 DATA "00000000000000000000000"
1000 DATA "00000000000000000000000"
1010 PROC outdisk(s(,))
1020   OPEN FILE 5,"0:portrt",WRITE
1030   WRITE FILE 5: s(,)
1040   CLOSE FILE 5
1050 ENDPROC outdisk
1060 PROC pause
1070   FOR q:=1 TO 1000 DO
1080     NULL
1090   ENDFOR q
1100 ENDPROC pause
1110 END
```


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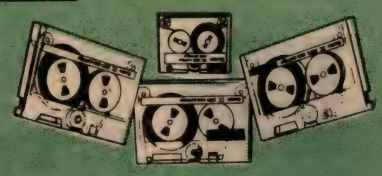

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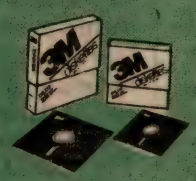

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Comal Corner continued from page 159

WRITE statement. First OPEN FILE #, "0:PORTRT", WRITE opens the file for a suquential write. Follow this with WRITE FILE #: a(,). Finally, close the file with CLOSE FILE #. All of this is accomplished by the procedure tacked on near the end of the program.

You may, if you wish, save the actual Portrait on disk for future modification or use. First, if you want to retain the program, save it to disk. As there is only one sprite, consisting of 21 lines, the easiest way to save it separately is to list it on the screen, with the first line at the screen top. Then, immediately below the last line, type in NEW. This deletes the entire program. Once you have typed in NEW, all that remains of the program are the lines displayed on the screen. And these are only on the display, so don't scroll.

To capture the Portrait in a usable form we merely take advantage of the screen editor capability. Move the cursor to the first DATA line and press RETURN. Repeat this for each line of DATA. The good old screen editor has now captured these lines as a program. So you can save them just as you would any other program. Later, if you wish, you can load them, modify them, or incorporate them in a different program.

Well, we've got good news and bad news. That was the good news. Now lets get down to the nitty-gritty. How does the program actually work. Very well, thank you.

So much for humor. Now to work. To successfully convert our picture into sprite-generating numbers we need an algorithm. This is a technical term for a process or procedure. Our algorithm is incorporated in lines 150 through 500.

Stepwise, here is what the process does:

1. Read a line of data to a string.

2. Select the first 8 characters of the line.

3. Select each of these characters and treat them in reverse order.

4. Raise the number 2 to the power associated with the character position. This power is given by k, in line 210. Raising to the power of is a method of describing how many times a number is used as a factor in multiplication. For example, 2 raised to the 3rd power means 2x2x2. And 5 raised to the second power is 5x5. And so on for other numbers.

5. Determine the value of the leading character in the string.

6. Multiply the values obtain in steps 4 and 5, and add them to an initial place-holder, as shown in line 390.

7. Strip off the leading character of the string and repeat from step 3.

The result of this repetitive process is the assignment to a (ln,by) of a value which the Commodore sprite processor recognizes. The simple algorithm is repeated until 63 such numbers are generated. Useful variants exist for working with and developing sprites. Once the numeric values are captured they may be used just as any other sprite numbers are. In our next column we'll have Melody's Portrait darting, in resplendent beauty, here and yon on the screen.

Summary

We've examined some of the advantages of COMAL as a programming language, developed a simple program using COMAL instructions, and provided a few techniques which have a variety of uses. As we progress through the COMAL language we'll provide additional utilities and extended programs illustrating the potential of this language. (And, exciting promise, Melody says she'll include my portrait in the next column — for you lovers of beauty.

Help

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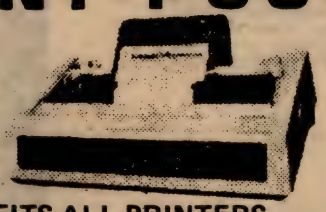

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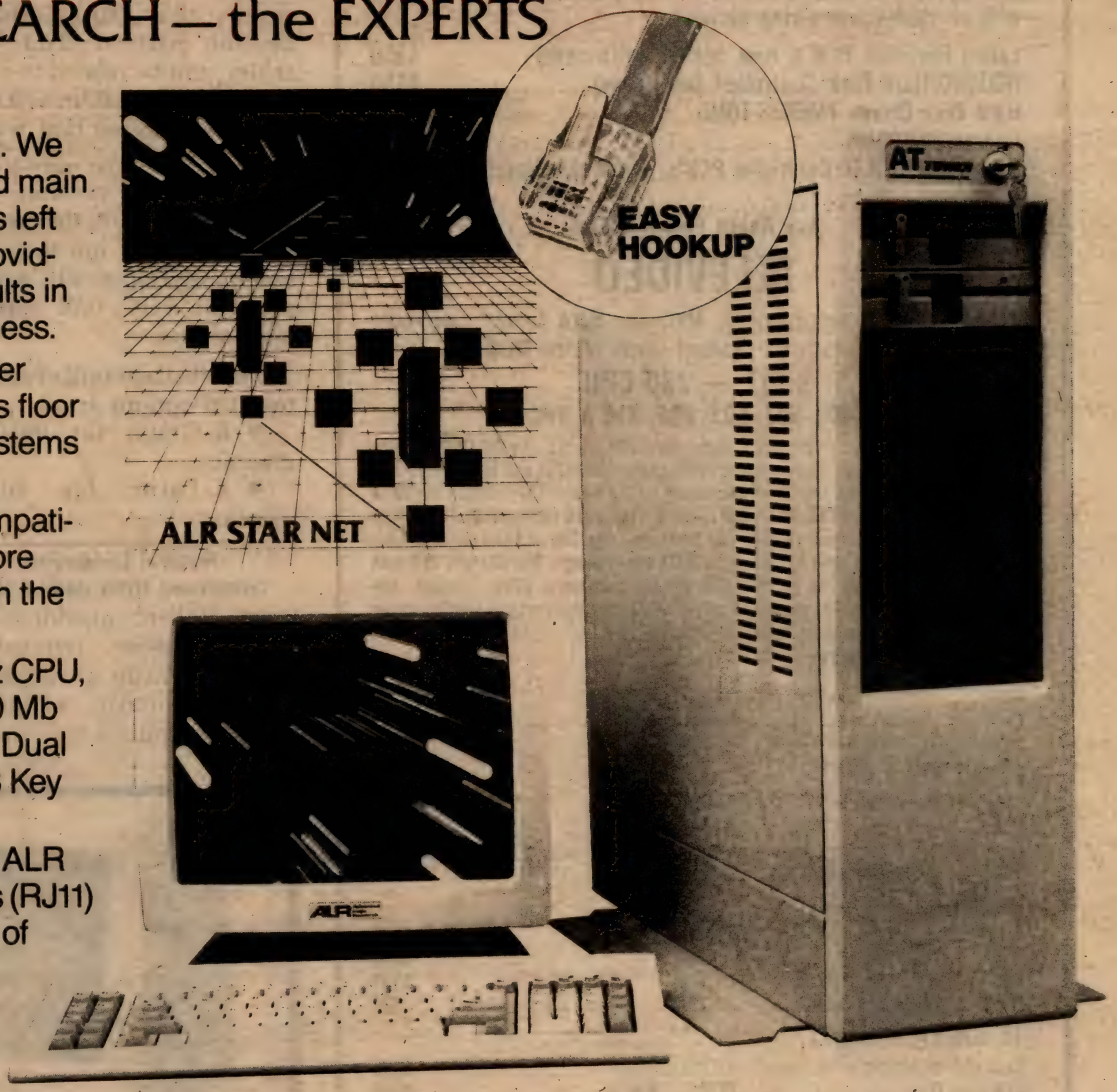

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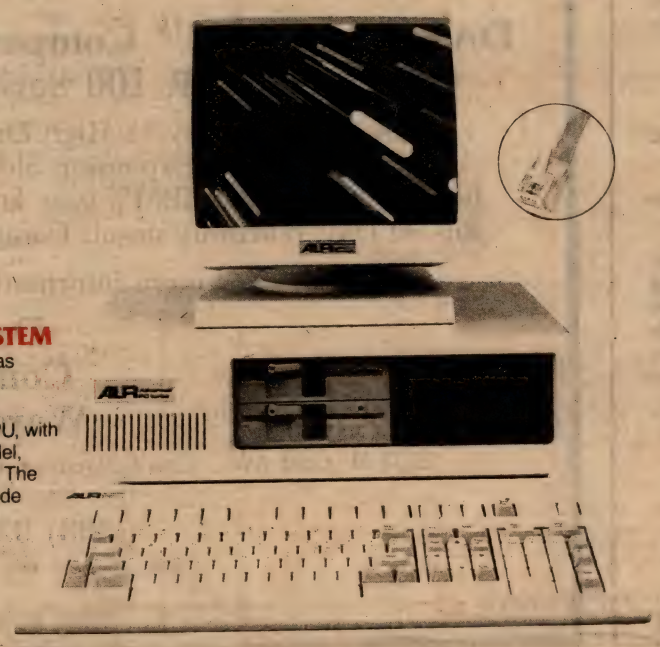

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KnowledgeMan
continued from page 110

budget, certain spreadsheet results may automatically become part of data base tables, and be related to other pieces of information as if they had been entered that way.

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Natural Language
continued from page 108

Janet Baker, president of Dragon systems, responded, "Dragon Systems specializes in computationally efficient speech recognition techniques. Our goal has always been the highest performance speech recognition that could be achieved in a desktop computer. Many separate improvements in performance and computational efficiency have now been brought together to allow, for the first time, natural language recognition in a personal computer."

One of the most remarkable features of the experimental Dragon recognizer is that it has been implemented primarily in software. The only processor which the Dragon Systems recognizer uses besides the microprocessor which is built into the personal computer is a simple 2 MHz 8-bit processor to aid in the real-time data acquisition of the speech signal. Several products are already available such that the new Dragon recognizer could be implemented as add-on capability just with software. Dragon Systems does not sell any speech recognition product directly to end users, but instead licenses its technology to OEM's who develop the finished product. Dragon points out that much development work remains to be done before such finished products will be available using the technology in this new experimental system. No firm price has yet been established, although the unit price to OEM's is expected to be below $2,000.

This application specific natural language capability is expected to open a new era of better man-machine interaction. The performance and cost effectiveness of the new Dragon recognizer will allow uses to enter text into computers much more easily than ever before. Furthermore, the capability of the present prototype system is just the beginning. Dragon Systems is continuing to do research to expand the capability of high performance, computationally efficient speech recognition. Eventually we will be able to talk to computers as easily as we talk to each other.

For additional information contact Dragon Systems, Inc., Chapel Bridge Park, 55 Chapel Street, Newton, MA 02158; (617) 965-5200.

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The Silver Box
continued from page 74

mat. The next box I purchased contained disks with somewhat rough polish and smoothness, and I am using them in the 48 tpi format only. The friction torque of this brand is on the lower side, with one four year old disk showing remarkably low motor current drain of only 95 milli-amps on the TEAC 55BV drive, which is about one half the value exhibited by the IBM brand of diskettes.

You should take a look again at the List 1. You will notice particularly low output fluctuation values attesting to the fact that the play in the hub hole is almost none. This means the seating accuracy of this diskette is very good, but with one drawback. That is, the diskette may remain in the drive time to time. The Mitsubishi drive I use ejects the diskette when the door latch is released. The OPUS sometimes needs a repeat of latch release operations.

This choice number two is used mostly in 96 tpi format.

The Wabash Pinnacle

I suspect the Pinnacle series of diskettes marketed by Wabash Datatech specifically targeted toward the home computing use. The disks have plenty of streaks and blotches showing non-homogeneous coating mixture or uneven distribution of lubricant, and with numerous deep burnishing scars. The amount of scars and amount of streaks and blotches vary from disk to disk.

Because of this variance and numerous, deep scars, this brand belongs to the fifth choice category even though the disks have some good polish.

The Kodak Diskettes

These diskettes had a modest amount of streaks attesting to uneven distribution of coating mixture, which you do not see in Fuji, 3M nor Maxell disks. The polish on the recording surface is fair, similar to 3M diskettes but purchased four years ago. The box of diskettes I purchased will be used for 48 tpi applications only, even though the diskettes were labeled as 96 tpi grade.

This brand is choice number three.

Maxell Diskettes

No streaks or ridges! This fact assures that the quality of the diskette is high but the surface has numerous, minute, low dimples and hills. The surface has moderately rough texture. The magnetic particles are not well polished nor flattened. I believe the other makes have fillers in the gaps between magnetic particles but in this disk the magnetic particles are more or less exposed rather than embedded in the filler-binder coating. I expect the magnetic property of this disk could be superior to other kinds but the level of polishing is less than desirable.

About four years ago I purchased this brand of diskettes along with OPUS and 3M, all single side, single density diskettes. Just to satisfy my curiosity, I ran one disk from these three brands through the Victor 9000 computer which uses 96 tpi SS drives putting more than 1 mega-bytes on just one side. All disks formatted fine without any error except the Maxell which showed several error locations.

The roughness on the surface may contribute to faster head wear than with other brands. So, I classify this disk in the third choice category and I use them in the 48 tpi format only, although the surface irregularity is at a minimum.

The IBM Brand

I have purchased only one box of this famous but seldom seen brand. The disks I got had distinct, numerous and straight scars across the disks, although they have good polish, as good as the 3M diskettes bought in 1984. The scars are apparently on the substrate and similar to the one you see on the recording surfaces of the Verbatim diskettes.

It seems that the surface of the substrate rather than the recording surface had been roughened for better adhesion of coating. These deep scars may contribute to high noise levels which may affect the data reliability in some situations such as when the gradual head displacement takes place in your drive as the effect of temperature cycling accumulates every day.

I put this diskette in my third choice category and using them to keep data in 96 tpi format.

The New Sanyo AT at Comdex

Some of you may already have some knowledge of new Sanyo, a type of machine most of us may not be able to buy for some time. This new, AT compatible machine has so much more power, storage space and execution speed than most oridinary programmers may require and consequently the net result is the higher cost of the machine.

Indeed, it has so much power and capability to cope with, all there is to be done in data processing operations, even for most of small companies having total employees of less than 500 and number of customers less than 2000 with several work stations connected to it. Of course all depends on how clever the chief programmer is and on the style of the business.

The Sanyo MBC-990's hard disk can accommodate 40 mega bytes of data. If you could hook a write-once-disk, so called the CD ROM, which could have 550 giga-bytes of capacity with unalterable records and ultimately safe against accidental erasures, to this business machine, it surpasses any imaginable requirements in home computing by an astronomical margin. Such CD optical disks are made by several companies including, Hitachi and Panasonic and will be available in quantities in 1986.

In the Fall Comdex, which opened November 20, 1985, in Las Vegas, I met the important people of Sanyo headquarters in Moonachie, NJ at the Sanyo booth and had a chance to chat a little. The MBC-990 was brand new, it is so new that they had only two in the United States and one had broken down at the booth. You should not blame this entirely on the power supply used in the machine. The electrical disturbance in any convention center is usually very bad, as bad as your computer being connected to the same service line as your wife's 2HP washing machine (having about 12kW peak input power, and what goes in can come out)!

In this setup, she will have power to generate tremendous-

continued on page 173

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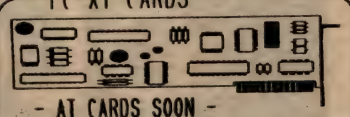

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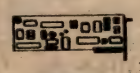

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Heath/Zenith continued from page 86

2 Product: 'Acceler8/16"

Description: software and hardware package (V-20/30 optional) that emulates an 8080 and CP/M 2.2, with utilities. Software emulation runs on PC or AT compatible.

Price: $89.95 - Software only: $99.95 - Software and V-20 chip: $109.95 - Software and V-30 chip

System Requirements: IBM PC compatible, 128K RAM, one drive, DOS 1.0 up

Update Policy: Bug fixes - free: Version updates $10 plus difference in version costs.

Utilities Supplied: Includes "Media Master" disk file conversion utility program ($39.95 value).

Terminal Emulation: Kaypro, Osborne, Heath/Zenith H-89

Benchmark Times: Compile - 30 secs. (Hardware mode): Run - 1 min. 2 secs. (Hardware mode)

DOS Calls Not Supported: BDOS - 1B, 1F: BIOS - 8, 9, A, B, C, D, E

Sold by: Intersecting Con cepts, Inc.
4573 Heatherglen Court
Moorpark, CA 93201
(800) 924-7888 ext. 251
(805) 529-5073

Comments

Intersecting concepts is best known as the makers of "Media Master," a disk conversion program that allows you to read, write, and format over 100 different types of CP/M formatted disks on your MS-DOS computer. They are now marketing two CP/M to MS-DOS emulation programs, "Acceler 8/16" (a "V" hardware support product) and "Media Master Plus ZP/EM" (a software-only emulation). Both emulators include the "Media Master" program as part of the package. (In fact, two competing emulators also include a licensed version of "Media Master" with their packages.)

Although I only got to look at a Beta-test copy of this program, it looks solid. It ran all the 8080 code it came across with no problems. The benchmark speeds it produced were second only to "RUN/CPM." I did not find any problems with the CP/M to MS-DOS interface, other than the stated "non-supported" BDOS and BIOS calls. If the release copy is as good as the Beta-test version, I can recommend "Acceler8/16" with no reservations.

"Acceler8/16," like several of the other emulator programs, includes a CCP interface that has the same enhancements as the popular ZCPR program. In addition to the ZCPR modes, you can also use the DOS "CHDIR" or "CD" command to change directories while in the CP/M mode. The Heath/Zenith H-19/89 emulation is the fastest I saw for that terminal.

3 Product: "Media Master Plus ZP/EM"

Description: Software package that emulates an 8080, and CP/M 2.2, with utilities. Runs on PC or AT compatible. **(V series not supported.)**

Price: $59.95 - Software

System Requirements: IBM PC or AT compatible, 128K RAM, one drive, DOS 1.1 up

Update Policy: Bug fixes - free: Version updates - $10 plus difference in version costs.

Utilities Supplied: Includes "Media Master" disk file conversion utility program ($39.95 value).

Terminal Emulation: Kaypro, Osborne, Heath/Zenith H-19

Benchmark Times: Compile - 1 min. 24 secs. Run - 5 min. 7 secs.

DOS Calls Not Supported: BDOS - 1B, 1F: BIOS - 8, 9, A, B, C, D, E

Sold by: Intersecting Con-Concepts, Inc.
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(800) 824-7888 ext. 251
(805) 529-5073

Comments

This is the "software only" version of "Accel8/16." It was the most predictable emulator package I used. If is crashed due to code problems, it produced clear error messages stating the problems. It was the fastest "software only" package I reviewed, but it also is "8080 code only" (even though the name "ZP/EM" might lead you to think it was a Z-80 emulator as well). The documentation was the clearest with this package, in my opinion. Intersection Concepts only charges twenty dollars more for ZP/EM over the standard Media Master price, so for the price, it is a very reasonable product.

4 Product: "RUN/CPM"

Description: Software and hardware package (V-20/30 included) that emulates a 8080, and CP/M 2.2, with utilities. (Micro Interfaces Corporation also has an Intel "ISIS" emulator available for PC compatibles using the "V" chip.)

Price: $99.95 - Software and V-20/30 chip

System Requirements: IBM PC compatible, 256K RAN, one drive, DOS 2.00 up

Update Policy: To registered owners only. Price not stated.

Utilities: Includes "Media Master" disk file conversion utility program ($39.95 value), and Xmodem communication pro-
gram.

Terminal Emulation: User configurable. Predefined terminals included are ANSI, DEC VT52, ADM3A, Visual 210, ADDS Viewpoint, Heath/Zenith H-19, Hazeltine Esprit, 1510, Televideo 950, and Kaypro 4.

Benchmark Times: Compile - 26 secs.: Run - 1 min. 2 secs.

DOS Calls Not Supported: BDOS - 1B, 1F: BIOS - 8, D

Sold by: Micro Interfaces Corp.
6824 N.W. 169th St.
Miami, FL 33015
(800) 637-7226
(305) 823-8088

Comments

Let me preface my remarks about "RUN/CPM" by saying that (like "Acceler8/16"), I have not reviewed a actual release copy of the program yet. This review is based on an early Beta-test version that Micro Interfaces Corp. was kind enough to send me. Final judgement on "RUN/CPM" should be reserved until release version is out and has been examined. The program is due for release by the time this is in print.

"RUN/CPM" is potentially the most powerful of the emulator programs I reviewed. When running in the CP/M emulation mode, you can run both CP/M and MS-DOS programs from the command prompt. This gives you the full power of MS-DOS utilities while in the CP/M mode. "RUN/CPM" also had the fastest benchmark times, so it has been optimized for good performance.

The terminal emulation package of "RUN/CPM" is the most flexible one I found. It can be "user configured" to handle just about any terminal you might run across, including function keys and graphics characters. Although the terminal emulator's video "throughput" time isn't the fastest, it's flexibility makes it very powerful.

The pre-release version of the program, however, still has some annoying bugs in it. A Pascal compiler program I ran had difficulty "chaining" from one program to another. There were some other problems with the CP/M to DOS interface that kept some programs from executing correctly.

For example, the BDOS "set user" and "read user" functions are not implemented by "RUN/CPM" (or most other emulators), which is O.K., since MS-DOS doesn't support user areas. Instead of just returning an error code to the calling program (which then usually continues as long as User #0 is the only active user), "RUN/CPM" insists on filling the screen with endless error messages; "!!! User Functions Not Supported!!!." This is a needless distraction and slows down program execution considerably.

"RUN/CPM" also printed error messages whenever I attempted to use a command with the CP/M wildcard character ("*"). I always got an error, "!!! Wildcards are not allowed through this CP/M interface!!!". If "RUN/CPM" doesn't support wildcards in CP/M, then this becomes a serious limitation of the program's usefulness.

If some of these problems are corrected, and MIC continues to support "RUN/CPM" aggessively, it has great potential.

5 Product: "Un/Emulator"

Description: Software and hardware (V-20/30 included) package that emulates the 8080, and CP/M 2.2, with utilities.

Price: $149.95 - Software and V-20 chip: $79.95 - Software only (Other configurations available)

System Requirements: IBM PC compatible, 128K RAM, one drive, DOS 1.0 up

Update Policy: Not stated.

Utilities Supplied: Includes "Media Master" disk file conversion utility program ($39.95 value)

Terminal Emulation: Heath/Zenith H-19, Z-100

Benchmark Times: Compile - 31 secs.: Run - 1 min. 2 secs.

DOS Calls Not Supported: BDOS - 1B, 1E, 20, 22, 27: BIOS - No Disk Access Allowed

Sold by: Weitzman and Wood Associates
580 N.W. 99th St.
Pembroke Pines, FL 33024
(305) 432-8025

Comments

The "Un/Emulator" program exhibited performance on par with "CPEM" and "Accel8/16." A HUG supplied H/Z-100 terminal emulator program is also provided with "Un/Emulator." Unfortunately, this program had some nasty habits (like checking for a floppy in drive "A") that made it somewhat bothersome to use on a hard disk machine. This company seems committed to serving the Heath/Zenith community especially, so it may be a good choice to check with them about any specific Heath 8-bit programs you want to bring over. When I visited with them, they mentioned that they are attempting to bring HDOS over to the 150.

6 Product: "CPEmulator"

Description: Software package that emulates a Z-80, and CP/M 2.2, with utilities. Runs on PC or AT compatible. **(V series not supported.)**

Price: $199.95 - Software only

System Requirements: IBM PC or AT compatible, 128K RAM, one drive, DOS 2.00

Update Policy:: Not Stated.

Utilities Supplied: Includes "Copycmp" disk file conversion utility (equivalent to "Media Master"), Modem7 communication programs, and numerous CP/M utilities.

continued on page 172

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Some Fine Points Of Pascal

Part II

by Randall Staponski

Part one of this two part series discussed Pascal's version of the subroutine called a function and the oddity of a function being able to call itself. The first part ended with the limitations of functions. Namely they are designed to receive one or more input items from the calling line but return only *one* item back. The procedure is a more powerful version of the function. It has a two way communications channel to the calling line which can send and/or receive multiple items. Procedures will be illustrated with the statement of a problem, a top down design to help write the code, and finally the program itself.

Every year almost everyone files a tax return by April 15. Most people only think about this once a year. However, there are usually one or more times during a year when a potential purchase will have an effect on the total amount of taxes at year end. The IRS provides a way to estimate taxes given taxable income. The equations necessary to do this are a part of IRS form 1040-ES. For example if your 1985 taxable income is greater than $21,020 but less than or equal to $25,600 the federal tax is $2,598 + 22% of the amount over $21,020. The tax bracket is 22%. That is for a taxable income between $21,020 and $25,600, 22 cents of each dollar earned in this bracket will go to the federal government. The estimated taxes for a taxable income of $25,000 is $2,598 + .22 x (25,000-21,020) = $3,473.60. Equations should only be used for making estimates. In addition they are only valid for taxable year 1985 and a status of married filing joint.

The top down design for this program is shown in figure 1. The I/O modules (level 0 and level 1) request the input from the user (which is taxable income), calls the procedure (CALCUALTE TAX AND BRACKET) and prints the entered income, the calculated tax, and the calculated tax bracket.

The procedure CALCULATE TAX AND BRACKET receives the estimated taxable income from the main program. If the income falls in one of the brackets then the tax and bracket is calculated. These values are then returned to the main program. If the entered income is not within one of the brackets then TAX is set to 0.0. A tax of 0.0 serves as a flag to the main program.

Although the program is short and simple, it can provide some enlightening results. Suppose you look at your 1984 tax return and see your taxable income was $25,200. Based on your recent merit raise you estimate a taxable income of $26,300 for 1985. Running IRSGOTYA you would pay $3,780.60 to the federal government. Also 25 cents of each additional dollar of taxable income would be paid in taxes. Now suppose you are considering putting $2,000 into an Individual Retirement Account (IRA) but are hesitant to reduce your savings account that much. Under present law contributions to an IRA are tax deductible. Assuming everything else remains the same a $2,000 IRA contribution in 1985 would reduce the estimated 1985 taxable income from $26,300 to $24,300. Rerunning IRSGOTYA for this lower amount shows a tax of $3,319.60 for a reduction of $3,780.60-$3,319.60 = $461.00. The tax bracket decreases to 22%. This means your IRA contribution will only cost $2,000 - $461 = $1,539. Also only 22 cents of each additional dollar will go for taxes up to an income of $25,600. Other potential purchases or transactions which affect taxable income can also be checked to judge the impact on taxes.

The usefulness of procedures is apparent in this example. In this case one item is passed to the procedure (taxable income) and two items are passed back (tax and bracket). If used as recommended a function is not capable of doing this. Procedures are called as shown in listing 1 line number 49. Pascal does not use line numbers. They are included so individual lines may be referenced. The parameter list is

continued on page 166

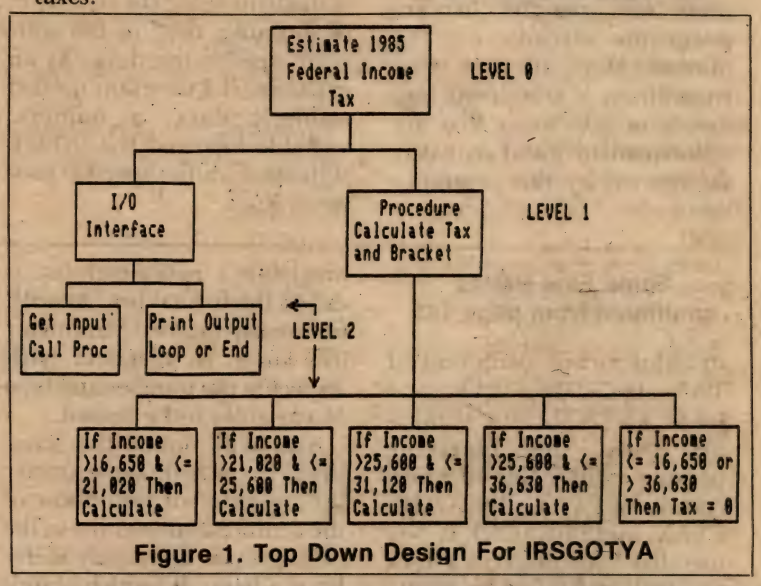

Figure 1. Top Down Design For IRSGOTYA

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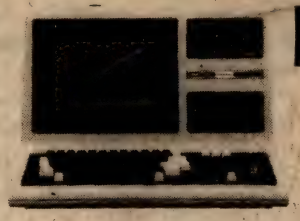

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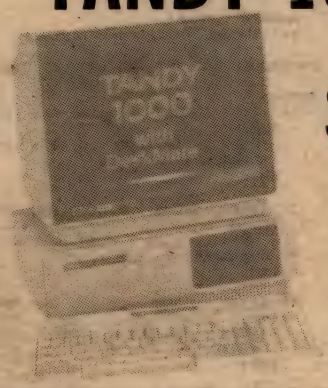

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A Data Entry Algorithm For BASIC Programming

by Gary West

Editors Note: We see so few articles on programming methodology these days that when a really interesting one comes along, I am happy to publish it. Here is such an article of interest to all who use BASIC.

Introduction

BASIC programmers are called upon, more and more, to write software that will be more "user-friendly" than are programs already on the market. Much of that user-friendliness is translated into menus or into icons that are self-explanatory and are easily interpreted by the program's users.

However, selection from a list of options or a series of pictures is not all there is to user-friendliness in software: a truly friendly piece of software will also prevent the user from entering anything that is not acceptable within the content and intent of the program.

The Need

In the old days of BASIC programming, data were input based upon the needs of the program, with INPUT statements using the two types of variables only as the software needed the data. As an example, if a program needed numeric data, a numeric variable followed the INPUT statement in the specific program line:

```
100 INPUT A
```

The above program line would allow the user to input any number; however, if the user accidentally (or intentionally) entered alphabetic data, the cryptic message "Redo from start" would appear or the program would stop with a "Type mismatch" error. Such things were accepted because only programmers were users and programmers have the patience and understanding to tolerate the whimsical drifts of software.

And, even with the entry of string data, there are limitations to the way the INPUT statement works. If the input requires only alphabetic characters, there is a need to let the user know that the pressing of a non-alphabetic key is unacceptable. And, at the same time, there may be options that the user has (such as the <Esc> key to exit the data entry process or the <BACK-SPACE> key to delete an incorrect character) as individual items are keyed in. The use of a string variable in an INPUT statement will not permit all the options that can be available to the user during the entry process.

And, now, the computer has come home, where people with less patience than programmers (but more money for the market) live with it. Those people want software that does not require hours of reading documentation that may or may not fully explain the program they've just paid $89.95 to bring home to the computer.

Part Of The Solution

The entry of data, whether numeric or alphabetic, can be controlled by software so that the user can enter his or her information with the least number of errors. The key to such entry of data is the use of the INKEY$ function (in some BASIC dialects, the GET statement). The INKEY$ function, when found in a program, instructs the computer to take the next key from the keyboard buffer (or from the keyboard, if the buffer is empty) and to continue execution of the program using that keystroke as

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Some Fine Points
continued from page 165

straightforward consisting of TAX_INCOME, TAX, and BRACKET. This list is mapped into the receiving parameter list in line 10 which consists of PTAX_INCOME, PTAX, and PBRACKET. Notice that VAR precedes PTAX and PBRACKET. This allows the procedure to receive an item from the calling line, modify it, then pass it back to the calling program via the parameter list. In this case PTAX and PBRACKET receive no useful information from the calling line. However, VAR is still necessary to send PTAX and PBRACKET back to the calling line. PTAX-INCOME can only be received by the procedure since it is not preceded by VAR. The calling line's parameter list is called the actual list while the procedure's parameter list is called the formal list. As with functions, the two parameter lists must be identical with respect to the number and type of variables to be passed.

You will notice the identifiers in the formal parameter list are different from those of the actual parameter list in the calling line. They only differ by the letter P (which stands for procedure) at the beginning of the identifier. Since this addition is not more descriptive than the original name why change the names at all? The answer lies in scope rules. Scope rules determine the area or range within a program where each identifier is known. These rules are not easy to master. In fact Pascal instructors seem to take particular delight in designing, giving, and grading tests dealing with scope rules. Although some very tricky situations can be devised, the rules themselves aren't too complicated. Variables defined in the VAR section of the main program are global and can be used by the main program and all functions and producedures. Variables defined in a function are known only to that function or, more precisely, that block even if they have the same names as global variables. The same is true of procedures.

The IRS example represents a potentially tricky situation. TAX, TAX_INCOME, and BRACKET are defined in the main program. These identifiers could be used by procedure CAL_TAX_AND_-BRACKET without any kind of parameter list since they are global. However, ambiguity results if the formal parameter list in the procedure uses the *same* identifiers passed to it in the actual parameter list.

Actually the ambiguity is only in the programmer's mind. Pascal treats the identifiers in the parameter list like local variables. Even though the name may be the same, a space in memory is reserved. In effect there are two distinct separate identifiers with the same name. One is a global variable and the other is a local variable. If you change the value of a local variable inside a block (such as a procedure or function) that change will not be known outside that block even if the identifier names are identical. All this is a longwinded way of saying variables passed back and forth in actual parameter lists and formal parameter lists should be spelled differently to reduce confusion. Also parameter lists should always be used to pass data so the isolation of each module is maximized.

Despite the possibility of occasional jokes about structured programming (some are funny), top down design, functions, procedures, and scope rules work together to help make programming easier. No one can keep the program's objective, flow of data, variable names, etc. in mind at the same time. Before the computer is even turned on, use of top down design will break the problem down into manageable modules. The combined use of scope rules, functions, and procedures helps preserve the independence of the top down modules when the ideas are translated into code. The end result, especially for big programs, is a reduction in programming time. ●

Listing 1. Program to estimate federal income tax using procedures.

```
TURBO PASCAL Program Lister, Copyright 1983 Borland International    Page
Listing of: IRSGOTYA.PAS

  1   PROGRAM IRSGOTYA (INPUT,OUTPUT);
  2           {VALID ONLY FOR MARRIED FILING JOINT STATUS}

  4   LABEL  START,STOP;

  6   VAR
  7     ANSWER : CHAR;
  8     TAX_INCOME,TAX,BRACKET :REAL;

 10   PROCEDURE CAL_TAX_AND_BRACKET(PTAX_INCOME:REAL;VAR PTAX,PBRACKET:REAL);

 12   BEGIN
 13     IF (PTAX_INCOME > 16650) AND (PTAX_INCOME <= 21120) THEN
 14       BEGIN
 15         PTAX := 1811.40 + 0.18 * (PTAX_INCOME - 16650);
 16         PBRACKET := 0.18;
 17       END;

 19     IF (PTAX_INCOME > 21020) AND (PTAX_INCOME <= 25600) THEN
 20       BEGIN
 21         PTAX := 2598 + 0.22 * (PTAX_INCOME - 21020);
 22         PBRACKET := 0.22;
 23       END;

 25     IF (PTAX_INCOME > 25600) AND (PTAX_INCOME <= 31120) THEN
 26       BEGIN
 27         PTAX := 3605.6 + 0.25 * (PTAX_INCOME - 25600);
 28         PBRACKET := 0.25
 29       END;

 31     IF (PTAX_INCOME > 31130) AND (PTAX_INCOME <= 36630.0)  THEN
 32       BEGIN
 33         PTAX := 4989.60 + 0.28 * (PTAX_INCOME - 31130);
 34         PBRACKET := 0.28;
 35       END;

 37     IF (PTAX_INCOME < 16650) OR (PTAX_INCOME > 36630.0) THEN
 38        PTAX := 0;

 40     END; (* PROCEDURE *)

 42     BEGIN (MAIN PROGRAM )
 43   START:     WRITELN('ENTER YOUR ESTIMATED 1985 TAXABLE INCOME');
 44          WRITELN('AFTER EXEMPTIONS AND DEDUCTIONS BUT BEFORE CREDITS');
 45          WRITE('ESTIMATE IS VALID ONLY FOR MARRIED FILING JOINT');
 46          WRITELN(' STATUS');
 47          WRITELN;
 48          READLN(TAX_INCOME);
 49          CAL_TAX_AND_BRACKET(TAX_INCOME,TAX,BRACKET);
 50          IF TAX = 0.0 THEN
 51            BEGIN
 52              WRITE('THE TAXABLE INCOME ',TAX_INCOME:7:2,' WAS ');
 53              WRITELN('OUTSIDE THE');
 54              WRITELN('RANGE OF THE PROGRAM (16,651 TO 36,630)');
 55            END
 56            ELSE
 57              BEGIN
 58                WRITELN('TAXABLE INCOME        TAX       BRACKET');
 59                WRITE(' ',TAX_INCOME:8:2,'         ',TAX:9:2,'   ');
 60                WRITELN(BRACKET:8:2);
 61              END;
 62          WRITELN;
 63          WRITELN('DO YOU WISH TO MAKE ANOTHER CALCULATON? Y OR N');
 64          READLN(ANSWER);
 65          IF ANSWER = 'N' THEN GOTO STOP
 66             ELSE GOTO START;

 68   STOP:   END.
```

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Data Entry continued from page 166

information. When the string variable to which that keystroke has been assigned is found, the value of that keystroke is analyzed within the context of the program.

The INKEY$ function does not require the <ENTER> key, and that can be a very positive feature in some entry procedures. However, the INKEY$ function allows the input of only one character — that is, it reads only one keystroke before going on with the program, which may not be very helpful if the user has been asked to type a phrase or his/her full name. But, with a little imagination, the INKEY$ function can be used to permit entry of long strings of characters, will check for "escape" sequences, will accept only certain characters from the keyboard, and can accept a <BACKSPACE> character that will not pull everything else on that line to the left as it backspaces.

(This last feature of the input algorithm is especially useful for screen displays with frames and in entry areas that are limited to specific sections of screen.)

The BASIC INKEY$ Function

The following program statement illustrates the basic use of the INKEY$ function:

```
100 A$=INKEY$:IF A$="" THEN 100
```

This program line accepts a keystroke and assigns it to the string variable, A$. The second part of the statement acknowledges that "no keystroke" is the same as a keystroke to the computer — that is, if the keyboard buffer is empty, the computer will accept the "no keystroke" and will continue with it. However, with the second part of the statement above, control is repeatedly sent back to line 100 whenever the keyboard buffer is found to be empty. (Note that there is "nothing" between the quotation marks in line 100 and that "nothing" is different from everything else, including a "space".)

The same concept can be applied to situations in which the user is limited to certain acceptable characters. Suppose that a displayed menu gives the user options of A, B, C, D, and E. The following program statement would provide those limits:

```
100 A$=INKEY$:IF A$<>"A" AND A$<>"B" AND
                 A$<>"C"
    AND A$<>"D" AND A$<>"E" THEN 100
```

This line will check each keystroke and if that keystroke is not one of the acceptable characters, control is returned to line 100 for another keystroke. This program statement is a "loop" in that it continues to return to itself until an acceptable key is pressed.

If the program can accept either upper- or lowercase characters, then line 100 would need modification to include the lower characters:

```
100 A$=INKEY$:IF A$<>"A" AND A$<>"a" AND A$<>"B" AND
    A$<>"b" AND A$<>"C" AND A$<>"c" AND A$<>"D" AND
    A$<>"d" AND A$<>"E" AND A$<>"e" THEN 100
```

Following an acceptable keystroke, the variable can be used, within the program, as any other variable to which a value or string has been assigned.

The BASIC Input Algorithm

The basic algorithm for using the INKEY$ function is this:

(1) find a keystroke in the keyboard buffer;

(2) test it for acceptability;

(3) if not acceptable, return for another keystroke;

(4) if acceptable, add character to data string and return for another keystroke; and

(5) if acceptable character ends input, continue program execution.

The following routine will illustrate one way the INKEY$ function can be used for entry of the user's name:

```
100 ' Routine for entry of user's name
110 A$=INKEY$:IF A$="" THEN 110
200 N$=N$+A$
205 PRINT A$;
210 GOTO 110
220 ' Continue with the program
```

The routine above allows the user to press a key (in line 110), from which a character is taken (assigned to A$), and added to whatever has already been keyed in (assigned to N$). After each keystroke, control returns in line 110, where another keystroke is taken.

As written, the routine is an endless loop because it will not know when the name is completed. To end entry of the name, the program can test for the pressing of the <ENTER> key, which is the same key that would end data entry if the program used the INPUT

```
120 IF A$<>CHR$(13) AND A$<>" " AND A$<>"," AND A$
    <>". " AND A$<>"." AND (A$<"A" OR A$>"Z") AND
```

be added to the above routine to complete entry of the name:

```
120 IF A$=CHR$(13) THEN 220
```

Now, after each keystroke, line 120 will compare the key to CHR$(13) — the <ENTER> key; if the <ENTER> key is pressed, control will be sent to line 220, from which the program will continue. But, now, the program knows that the user's name is a series of characters assigned to the string variable, N$.

Typically, in a name, there may be alphabetic, numeric, and special characters (such as spaces, commas, periods, and dashes). If the program is to test for those kinds of characters, each must be identified in the test statement. Line 120 (above) may be replaced with this line:

```
(A$<"a" OR A$>"z") THEN 110
```

Line 120 now tests each keystroke to see that it is one of the following:

(1) the <ENTER> key;

(2) a space;

(3) a comma;

(4) a period;

(5) a dash (hyphen);

(6) between uppercase A and Z; or

(7) between lowercase a and z.

If A$ (the value of the keystroke) does not pass one of those tests, control is sent back to line 110 for another keystroke. If a keystroke passes one of those tests, its value is concatenated to N$ and control goes back to line 110 for the next character in the name.

After passing one of those tests, the keystroke is passed on to the program. The program must have instructions about what to do next. The following line tells the computer what to do (and is identical to the first line 120, above) if the <ENTER> key is pressed:

```
130 IF A$=CHR$(13) THEN 220
```

Other Options For Data Entry

The above routine will permit entry of the user's name, accepting letters, spaces, and

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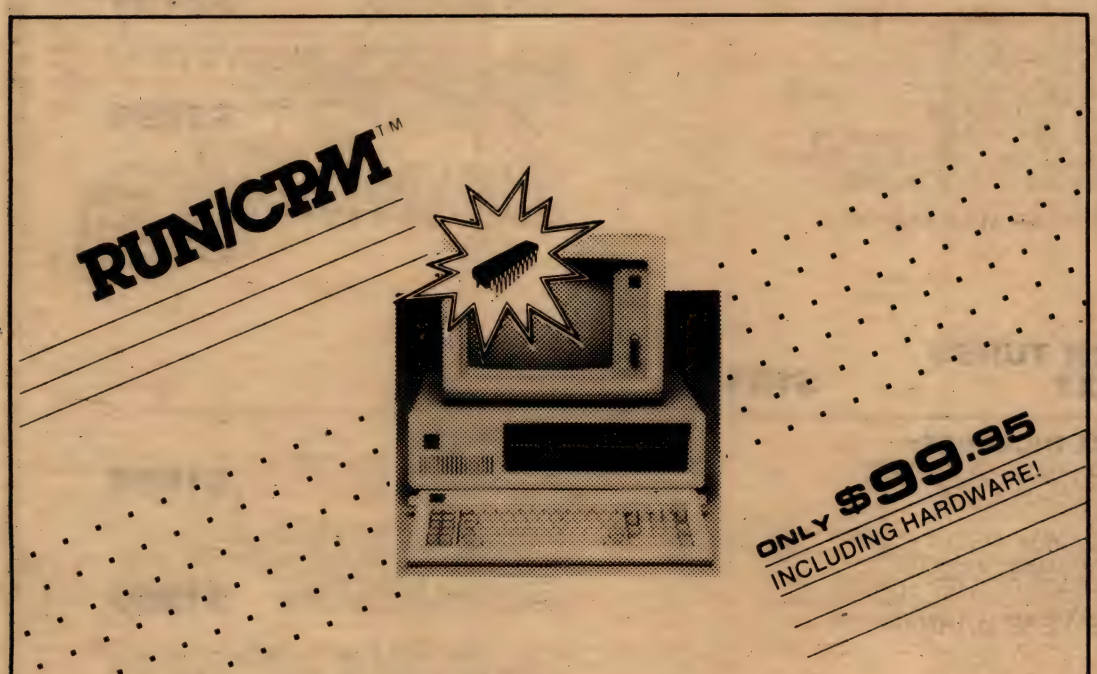

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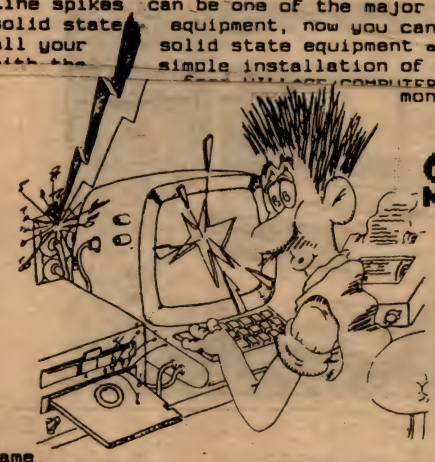

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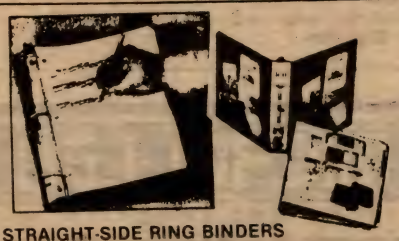

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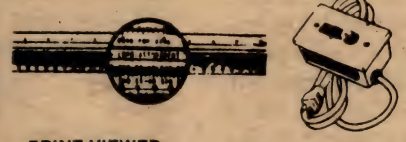

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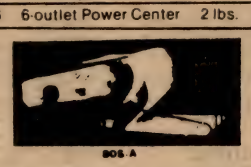

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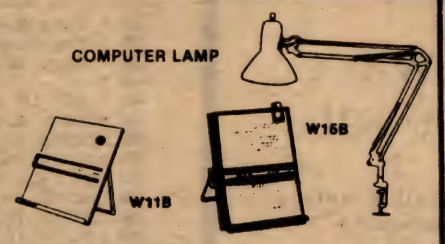

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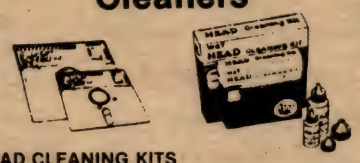

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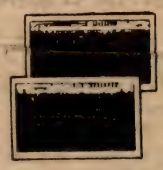

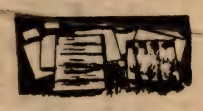

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Data Entry continued from page 168

various punctuation within those characters. If, however, a numeric key is pressed (or any other key representing a character not listed in line 120), nothing will happen because control will be sent back for another character.

If the user is to be given the option of "escaping" from the entry process, the program must also test for a character that is defined to do just that. That character can be any regular keyboard character; the <ESC> key is used often.

The <ESC> key is written as CHR$(27) because it cannot be entered directly from the keyboard to the screen. If the program is to allow the user to press the <ESC> key to start over again, the following line could be used in our routine:

```
140 IF A$=CHR$(27) THEN CLS:GOTO 110
```

That line will tell the computer to clear the screen and to go to line 110 (to start over again) if the <ESC> key is pressed. Control could be sent to any other part of the program just as easily as it is sent to line 110 in our example.

However, this line, alone, will not allow the <ESC> key to work. Because line 120 does not accept the <ESC> key immediately after a key is pressed, the value of that key will never get to line 140. To allow the program to accept it, we must add it to line 120 as an acceptable character:

```
120 IF A$<>CHR$(13) AND A$<>" " AND A$<>"," AND A$
    <>"." AND A$<> "-" AND (A$<"A" OR A$> "Z") AND
    (A$<"a" OR A$>"z") AND A$<>CHR$(27) THEN 110
```

With that small change, we have instructed the program to accept the <ESC> key as a valid keystroke for the purposes of the program. Line 140, then, tells the program what to do if the <ESC> key is pressed.

Backspacing Without Changing The Screen

The usual way to correct a mistyped character is to backspace and to type in the correct character. However, our routine will not accept the <BACKSPACE> key as input since it is not specifically listed in line 120, above. In order to allow for correction of errors, that key must be allowed — and, after it is allowed, it must function as it would if an INPUT statement were being used rather than INKEY$ function.

The <BACKSPACE> character cannot be printed directly to the screen (except as a movement of the cursor to the left); therefore, it is represented in program statements as CHR$(8). By including CHR$(8) in line 120, we can instruct the program to accept the <BACKSPACE> key as valid input:

```
120 IF A$<>CHR$(13) AND A$<>" " AND A$<>"," AND A$
    <>"." AND A$ <>"-" AND (A$<"A" OR A$>"Z") AND
    (A$("a" OR A$>"z") AND A$<>CHR$(27) AND A$<>
    CHR$ (8) THEN 110
```

Line 120 will now let the <BACKSPACE> character pass into the program. The program must now determine what to do with it after it is passed to A$.

The following line will give instructions to the program about what to do with the <BACKSPACE> key:

```
150 IF A$=CHR$(8) THEN PRINT CHR$(29);CHR$(32);
    CHR$(29);:N$=LEFT$(N$,LEN(N$)-1):GOTO 110
```

Line 150 tests for the <BACKSPACE> character. If it is found (in A$), the program prints a "character-left" (CHR$(29)) to move the cursor back one space. Then a space (CHR$(32)) is printed over the character that is now at the cursor. The "character-left" is then printed again to move the cursor back to the position where the blank space was just printed. In effect, a "destructive backspace" has been executed.

But that's only half of the function of the <BACKSPACE>. It must also remove the character from the string the program has been building. When the blank space was printed over the incorrect character, it was removed from the screen; but it was still the last character attached to N$. Thus, the <BACKSPACE> must also remove the character from the string assigned to N$. That is done by setting N$ equal to itself minus the right-most character. That is done, also, in line 150, when N$ is assigned the left-most characters based on its length at the time of the <BACKSPACE>.

After the <BACKSPACE> has taken care of the screen and the string assigned to the word-building variable, control is sent back to line 110 to look for another keystroke.

An Example That Adds One Other Thing

The following routine will incorporate all of the cases given above and will include one other tool for your use. The additional tool will prevent the <BACKSPACE> function from moving too far to the left, which can result in an attempt to print in a column to the left of column 1 or can destructively backspace over a prompt that the program has placed on the screen:

After keying in this routine, run it, and key in your name. When your name is complete, press <ENTER>. Then run it again, but after a few letters, use the <BACKSPACE> to delete everything you've typed. Then <BACKSPACE> one more time. If the INPUT statement had been used in this routine, two negative things would have happened: (1) the right side of the frame around entry area would have been pulled to the left as the <BACKSPACE> key was pressed (making for an unsightly — and potentially confusing — display) and (2) when a <BACKSPACE> is pressed after the name is already deleted, the cursor would move back over the displayed prompt, deleting it as it moved. Neither of those display problems should exist in software that is sold commercially.

This basic entry algorithm and routine can be used with any entry situation, trapping for every keystroke as data are entered. For numeric data, the entered string can be VALued and, then, treated as numeric. The maintenance of screen borders or text to the right of data being deleted (with <BACKSPACE>) and the preservation of screen prompts because the <BACKSPACE> can be stopped from is leftward movement are additional factors to consider in building program entry routines. The integrity of screen displays can have a lasting effect on the perceived integrity of the software package that is being marketed for people who need the friendly touch. ●

```
10 ' Data Entry with INKEY$
20 ' Copyright 1985
30 ' Gary West, Allendale SC 29810
40 '
45 ' SET UP SCREEN----------------------------------------
46 SCREEN 0,0:KEY OFF:WIDTH 80:CLS
50 LOCATE 12,10:PRINT "Type your name and press (ENTER):"
60 LOCATE 14,10:PRINT CHR$(201);
70 FOR X=11 TO 28:LOCATE 14,X:PRINT CHR$(205);:NEXT X
80 LOCATE 14,29:PRINT CHR$(187)
90 LOCATE 15,10:PRINT CHR$(186):LOCATE 15,29:PRINT CHR$(186)
100 LOCATE 16,10:PRINT CHR$(200);
110 FOR X=11 TO 28:LOCATE 16,X:PRINT CHR$(205);:NEXT X
120 LOCATE 16,29:PRINT CHR$(188)
130 ' DATA INPUT-------------------------------------------
140 LOCATE 15,12
150 A$=INKEY$:IF A$="" THEN 150
160 IF A$<>CHR$(13) AND A$<>" " AND A$<>"," AND A$<>"." AND
    A$<>"-" AND (A$<"A" OR A$>"Z") AND (A$<"a" OR A$>"z")
    AND A$<>CHR$(27) AND A$<>CHR$(8) THEN 110
170 IF A$=CHR$(13) THEN 220
180 IF A$=CHR$(27) THEN 250
190 IF A$=CHR$(8) AND POS(0)<>12 THEN PRINT CHR$(29);CHR$(32);
    CHR$(29);:N$=LEFT$(N$,LEN(N$)-1):GOTO 150 ELSE IF A$=
    CHR$(8) THEN BEEP:GOTO 150
200 PRINT A$;:N$=N$+A$
210 IF LEN(N$)=15 THEN 220
215 GOTO 150
220 IF LEN(N$)=0 THEN BEEP:GOTO 150
230 ' END OF PROGRAM OPTIONS-------------------------------
240 LOCATE 24,1:PRINT "That's your name.";
250 LOCATE 25,1:PRINT "1=RE-RUN    2=QUIT";
260 Y$=INKEY$:IF Y$<>"1" AND Y$<>"2" THEN 260
270 IF Y$="1" THEN CLS:RUN
280 END
```


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continued from page 164

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Comments

Although "CPemulator" was the slowest (software only...remember) and most expensive emulator I tested, it also ran more software than any other. This is partially due to the fact that it emulates a Z-80, where most of the other programs only handle 8080 code. It is also due to the fact that the CP/M DOS emulation appears to be one of the more mature products (I tested version 2.4...most other products are version #1 or Beta-test).

I was a little disappointed in the documentation and packaging of "CPemulator." It was not worse than the other emulator programs, but for $200, I expected a little more pizzaz. If GTEK adds the NEC "V" support to this obviously superior software product, it may become the outstanding CP/M emulation package on the market. As it stands, it is the best software that I tested, but has its limits. ●

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"For reports and presentations, the HP ColorPro plotter produces multicolor pie, bar and line graphs and text charts on 8½ x 11-inch (A4/A-size) overhead-transparency film and paper. This plotter offers fine-line quality -- one of the main features that have made HP plotters a leader in the market," said McClendon.

The new plotter's high resolution of .001 inch (0.025mm), which is four times better than most published competitor specs, allows the plotting of solid areas of color and continuous straight lines, HP said.

The HP ColorPro plotter has a solid foundation of software support. Packages already supporting the business plotter range from popular integrated packages with graphics, such as 1-2-3 and Symphony from Lotus; dedicated graphics programs, such as Decision Resources' Chart-Master and Sign-Masters; and HP's own Graphics Gallery and Textcharts.

When customer needs expand, such as to accommodate emerging graphics standards, a ROM cartridge slot lets the ColorPro plotter adjust to those needs. A graphics-enhancement cartridge available as an accessory will add more advanced capabilities to the plotter, including a larger buffer and more advanced graphics commands.

Fiber-tip Pen Rate: 15.7 IPS

The plotter's mechanical arm maneuvers color fiber-tip pens at the rate of 15.7 inches (40.0 cm) per second. Pen selection is made from an eight-pen carousel via front-panel controls or program commands. When returned to the carousel, pens are capped automatically so they will continue to produce colorful and clearly lined graphics with fresh ink.

HP developed the ColorPro plotter for business professionals who need to produce effective charts and graphs com-

continued on page 174

6809 SBC

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The Silver Box
continued from page 163

ly powerful transient pulses which will be superimposed on the power source and sometimes powerful enough to set a fire onto your electrolytic capacitors in the power supply (a truly hazardous situation if you happened to be close by unprotected and unexpecting as in my experience several years ago). But, if you had installed some surge absorber such as GE's or TEC's MOV (Metal Oxide Varistor) in right places, this accident could have been prevented. I did not say this because my friend happened to be selling it and having difficulty in convincing computer engineers to justify the added cost, about 30 cents each!

My Sanyo has two good size varistors which you can buy at any Radio Shack store. (Catalog No. 276-568B). One was added to the power line at the entrance to the power supply, the other was placed behind the auxiliary power outlet marked "USE; MONITOR, TV." Then preferably the computer and all the peripherals should be connected to a surge-protecting and noise filtering power strip. With the two varistor protection, I never lost any bit even when my wife switches on her 16 pound motor; except when we had three hours of total blackout.

The Sanyo AT is a big box, about five times the volume of my Silver Box. It has everything other AT clones have. 1.2 megabyte floppy or 360K floppy, hard-disk, switchable clock speed, 80286 CPU with 80287 socket, etc., etc., and the price range being quoted was very competitive. You should be aware, however, that Japanese Yen is fluctuating and least stable at the moment. The lowest level pricing of 2,000.00 estimated price could be 2,200.00 or depending on where the exchange rate is heading it could be 2,400.00. I will file a complete report if I was given a chance to put my hands on the AT in the near future.

Other Discussions Due

I received one letter complaining of my filling the column space with other than the further reports on the Newword customizing capability. On this word processing package I received total of one letter. The dealer I referred to received three telephone calls inquiring about it. Did I misjudge on the level of readers' interest? If so please write.

Regarding serial communications, I heard about lacking(?) capabilities of the Sanyo MBC550/555 in this area, and naturally I wanted to write about it, but there came almost no encouragements from the readers. You may want to know what I can schedule if interest were proven to be high.

Besides the Turbo 3.0 communication program I am writing which is temporarily called COMM4.PAS, I obtained the SOURCELINK, a version of XMODEM and another turbo program called QMODEM (compiled with no source), a freeware. I am rewriting the portion of receive action routines in assembly language so that my program can handle 2400 baud communication with ease. My program will use polling technique rather than being interrupt driven.

One problem you might encounter if you use interrupt driven serial communication program is that the DOS inhibits interrupt time to time when the control is inside the DOS. When this happens your computer will become deaf mute for the period and miss anything coming to the line. Also the circuit has been designed so that the serial board puts up interrupt flag only when the transmitter register is full, even during a receive session.

If a noise or interference feeds a pulse to RTS input the contents of the register will be sent out and the serial board stops sending interrupt signal, a total disaster. This situation can be helped if you reconfigure the 8251A chip to receive only and jamb the transmitter register with a plug byte, but, then the true duplex capability will be lost. To tell it short, I found polling method more satisfactory.

In regard to the serial hardware, if you give us enough push, we can supply you with a bare serial board from which you can assemble one yourself.

Q And A Corner

Starting next month I'm planning to have a small Q And A Corner in this column to answer the "most" asked questions on the Sanyo computers and related software.

A Total Disaster

As I have warned in the last column, one reader has written me telling his horror story of destroying his computer by changing the limit resistor in his power supply. He reported that the ongoing price of the CPU board is $800.00! Be careful when you work on the power supply and test it thoroughly before reconnecting it to your computer board. ●

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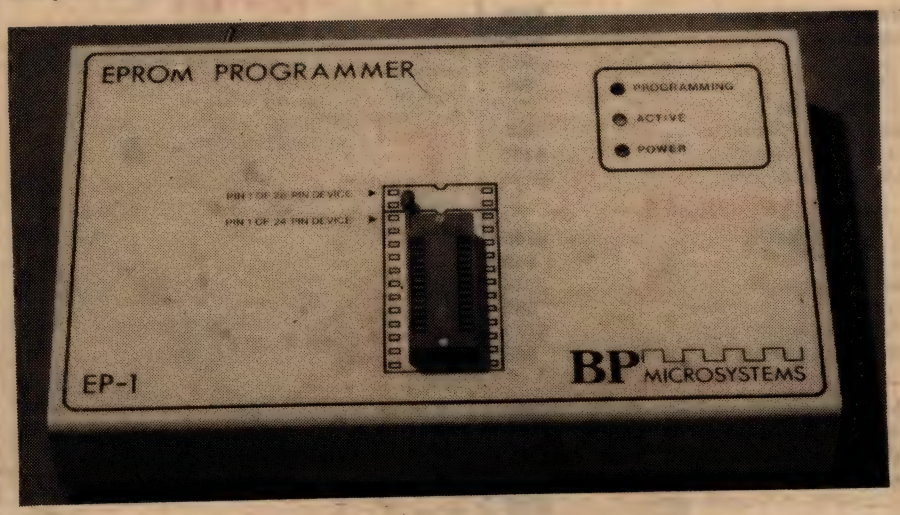

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Heath/Zenith continued from page 172

municating conclusions based on number analysis.

A Wharton School report indicates that presenting complex information in graphics form can shorten business meetings up to 28 percent; increase the ability to sell ideas, and make information easier to understand.

Also ideal for those who do have computer-programming skills, the new plotter features the HP-GL programming language, which allows users to create programs for specialized business and technical needs.

Full Range of Supplies

A full range of supplies for the HP ColorPro plotter is available from HP, including fiber-tip pens in two widths and 10 colors for paper (seven colors for transparencies), A/A4-size regular and glossy paper, and fast-dry transparency film.

Additionally, the plotter runs with desktop and personal computers from numerous manufacturers including HP, IBM, Apple and Compaq.

Compatible with most popular personal computers, the new plotter may be purchased with either of two interfaces: RS-232-C or the IEEE-488 bus.

The lightweight HP ColorPro plotter is easy to move from desk to desk and requires a minimal amount of space. It weighs 12 pounds (5.5kg) and measures 18.1 inches (460mm) wide by 12.1 inches (308mm) deep by 4.9 inches (125mm) high.

The new ColorPro plotter fills an important niche in the HP family of small-format graphics plotters, which also includes the HP 7475A and HP 7550A.

For the technical professional, the HP 7475A six-pen plotter produces high-quality A4/A- and A3/B-size graphics on polyester drafting film, as well as on paper and overhead-transparency film. The HP 7550A is an eight-pen plotter suitable for both shared-resource environments and high-volume individual users. It produces both A4/A- and A3/B-size graphics on a full range of media, and features automatic sheet feed.

U.S. List Price

The new eight-pen ColorPro business plotter (HP 7440) is $1,295.

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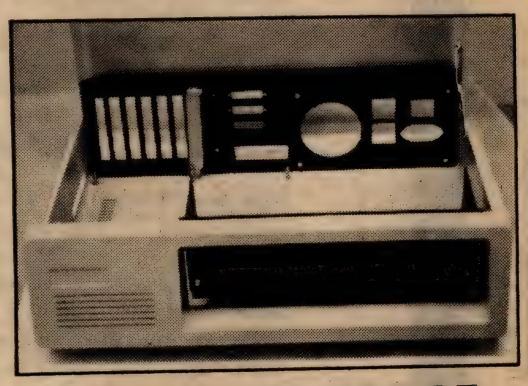

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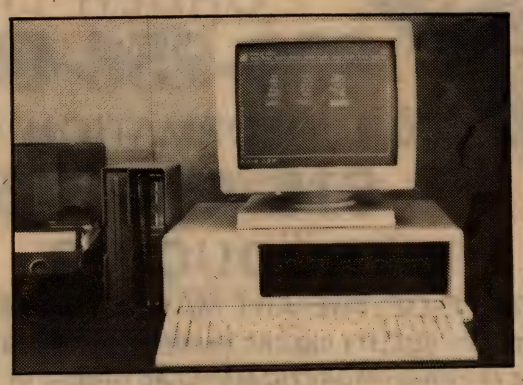

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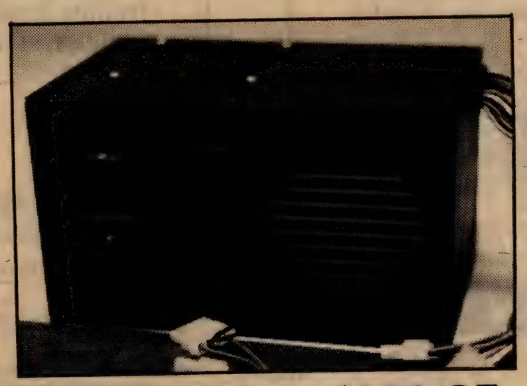

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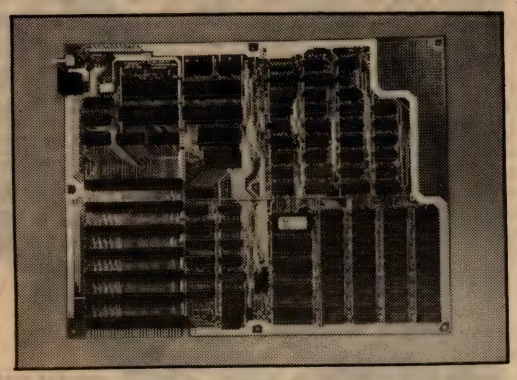

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PROfessionally Speaking continued from page 77

involves only 1s and 0s. Also, remember that the computer can only add. A simplistic view of the device and its usefulness. Not really, it keeps the awesome power of the computer in prospective. AI provides you with the potential to expand your ability to accomplish. The hardware and software of an "artificial intelligence system" provides you with the means of setting up the rules and values that you use to make decisions. This includes the weighted logic your experience and training have taught you. With all of this entered, the machine has a limited capacity to make judgement decisions. Since you provided the rules and logic, you should agree. You don't? Well, remember that the machine is being consistent and that it can only do what you have told it how to do. It cannot do what you "want" it to do nor can it do more than you have told it how to do. The whole idea being that with all of this in the machine, others can ask "you" questions and get answers by addressing the machine.

Rather than being a replacement for humans, AI is an enhancement for people. Like the limit switch or map or programmable controller, it can reduce the burden of routine so that there is time to progress. There is really nothing new involved in the results. The new is in the way and the speed with which problems are solved. You design the maze and you define the parameters for the various choices that are permitted along the way. As others negotiate your maze they must abide by your rules so that they finish at the point you have already determined under the circumstances they have described. This means that you are able to work uninterrupted for longer periods of time because your mechanical assistant is providing the proper answers to the routine "let's ask the expert" questions.

Expanding on the abilities of AI to assist, I can see many applications that will reduce the "routine" burden on humans as the hardware and software become better defined and more accessible to the average business. This will be an evolutionary process with many missteps. Part of that will be due to the fact that the application was a novelty and had no useful or profitable value. Another part of it will be the over simplication of the process which will eliminate the diversity and randomness of the situation upon which we thrive. Another factor that will cause problems is the lack of planning.

We cannot survive in a vacuum, be it physical, emotional or intellectual. Without proper prior planning we will begin to create vacuums that will be destructive. Therefore, we are going to have to provide new environments and challenges to ourselves and others as we use the tool of AI to reduce many things to "routine." Many people have spent their lives productively doing what is now routine. Some of these people were challenged to do other things. They participated in and promoted the transition of the task from "challenge - human decision maker required" to "routine - machine control recommended."

Change is our only constant. Within each generation there are the three types of personalities. Those that make it happen, those that watch it happen and those that don't know what is happening. Those that make it happen are the most satisfied because they are always looking forward to the next challenge. They are exercising the maximum amount of control over their lives and the directions they choose to travel. Those that watch have mixed emotions because they are satisfied with their lives but wouldn't object to some changes. They tend to lack the consuming drive it takes to lead the way and shake the status quo. Those that don't know are frustrated. They exercise little or no control and have less sense of direction. They are the most easily replaced and the most dangerous to displace.

Pressured from every angle and convinced that the only way to "get" is to "take," this third group lashes out violently in all directions and most often at the weaker links in the chain that they see binding them. Unrestricted they are not free because they have no

continued on page 177

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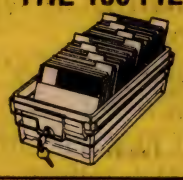
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PROfessionally Speaking continued from page 176

satisfaction. The solution lies in the ability to move the members of group three into group two. This requires that they be trained and motivated. The training is easy because it is external and there is a large body of knowledge on how to do it. Large institutions devoted exclusively to the transfer of the "how to" exist and are motivated to become larger and perhaps better. There are immediate and visible rewards for those who know "how to." It is the why to that seems to elude so many in all of the groups.

Motivation comes from within and is nurtured from without. When you are without, within dies. The digression has not been without purpose. At the onset I was talking about TI. Throughout I have had TI clearly in mind. What I would like to propose here is a typical textbook situation where we, as users marshal our strengths, overcome our weaknesses and provide the force to motivate. The organizational frameworks are in existence, the communications networks are in place and the power is available. Depending on the outcome you desire, your course of action is simple and logical, but it requires YOU!

If you want to motivate TI towards open, active, progressive support of the TIPC, then join their supported user group, be an active, contributing, participating member and prove that corporate support of the personal computer and its nonspecific, non-VAR supported users is worthwhile. Or you can take the alternate route and become active in supporting an independent user group organization. This will present a viable motive to the third party vendors to meet the needs of the existing users. It could also have the side effect of convincing TI that the PC should join the home computer. I leave that soapbox to Randy Holcomb and his Ravings.

Inaction will have one sure outcome. TIPC users will have elected to become members of group three. When I consider myself "typical" of the TIPC users, I find inaction a totally unacceptable possibility. I want you to become active and I feel certain that either or both of the users groups can provide focus for the force of users necessary to provide motivation. Because of the independence of TI users I also believe that the increased power will be balanced in the groups. This will benefit all of us by showing both TI and the third party suppliers that increased support is good business. So, as an independent TI user I will only say that I am making my choices and I am actively supporting the forces that I feel will promote the outcome most desirable to me.

Next time I will get much more practical and tell you about some of the interesting things that I have found that will provide you with some concrete assistance on a daily basis. If any of you have some better ideas, let me hear from you. I am willing to learn and you might even be able to change my mind. Now here are the contacts I promised.

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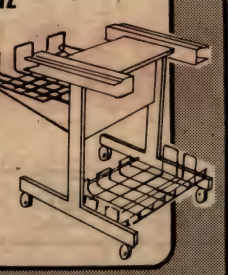

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Enough Already

by L. J. Kutten

It seems everybody in the computer industry is putting disclaimers and limitations of liability on their products regardless of whether the product needs it or not. For example, I recently received a book from Scott Foresman and Company entitled *MicroSoft BASIC Programming for the Mac*. It contained a "Notice of Liability" that stated neither the author nor Scott Foresman "shall have any liability to [the] customer or any other person or entity with respect to any liability, loss, or damage, caused or alleged to be caused directly or indirectly by the programs contained herein. This includes ... loss of business or anticipatory profits, or consequential damages from the use of the programs." And what kind of book could cause such loses? According to the author it was a "beginner's book" in BASIC programming. While it contained a multitude of short programs that explained fundamental concepts of BASIC programming techniques, there was nothing in the book or programs that could cause either the author or publisher to suffer liability. Scott Foresman is not alone in using a disclaimer. They can be found in books and software regardless of their nature or complexity. I even heard of a disclaimer in an educational program designed to teach preschool children to recognize numbers and letters.

Where will this all end? Undoubtedly sooner or later pencil and erasure manufacturers will put disclaimers on their products saying they are not responsible for lost profit if their products cause a consumer to suffer damages because he or she added a column incorrectly or erased the wrong line.

Why computer vendors use these disclaimers on all their products is beyond comprehension. Contrary to public opinion, in many instances, the disclaimer or limitation of liability is not worth the paper they are written on in the event litigation occurs. According to a review of the computer cases I did for a book on software law for Kluwer Law Book Company, a disclaimer or limitation of liability has no effect on a consumer transaction and very little effect in a business transaction involving an unsophisticated business consumer.

First and foremost, a disclaimer has no effect on an express warranty. All to often vendors assume an express warranty can only be created by them making an express promise to a buyer. They are mistaken. A statement of fact made in an advertisment, an instruction manual, and so forth is an express warranty. Take the case of *Consolidated Data Terminals v. Applied Digital Data Systems*, 708 F.2d 385 (5th Cir. 1983). The defendant marketed the Regent 100 terminal with advertised specifications of 19,200 baud. The terminal could not work at that speed and the specification was lowered to 1900 baud. When sued, the defendant argued that "the warranty disclaimer clause incorporated into each ... contract negatives any other ... promises contained in oral or written descriptions of the goods or in promotional literature." The Court disagreed. Since the statements regarding the terminal's 19,200 baud capability was an express warranty, they could not be disclaimed as a matter of public policy.

Secondly a limitation of liability has no effect if it fails its essential purpose. Assume the contract says the vendor shall repair or replace the defective software or hardware and he is unable to. In such event the limitation fails. In *RRX Industries v. Lab-Con, Inc.*, 772 F.2d 543 (9th Cir. 1985) the defendant agreed to provide a working medical laboratory software package for $40,866.66. When it failed to correct the bugs, it was sued. The Court disregard a contract provision limiting damages to the amount of the contract and awarded additional damages of $6,364 for overtime spent by the plaintiff trying to get the software to work and $1,142 for additional costs.

Finally vendors should be aware that the doctrine of unconscionability limits their ability to contractualy limit their liability. In recent years a trend has appeared in computer cases where the Court examines the parties relative computer sophistication rather than their commercial sophistication. This trend is clearly seen in two cases, *The Glovatorium, Inc. v. NCR Corp.* No. C-70-3393 (N.D. Ca. May 1, 1981) (unreported oral decision) reprinted in 1 CLR 141 (1982) aff'd 684 F.2d 658 (9th Cir. 1982) and *Horning v. Sycom*, 556 F. Supp. 819 (E.D. Ky. 1983).

In *Glovatorium* the plaintiff was a small first-time computer user. It purchased an NCR SPIRIT/8200 computer system to do routine accounting. The system failed to work and Glovatorium sued NCR. The jury awarded compensatory damages of approximately $225,000 for intentional misrepresentation, $50,000 for breach of warranty and $2 million for punitive damages.

NCR defended on the grounds that the contracts contained disclaimers and limitations of liability. The trial court felt otherwise. It said "if there is ever a reason for a holding that these provisions in these contracts should not be enforced because of unconscionability, this is the A-number-one case." It noted that NCR had targeted "businesses that have never used computers before, who do not have any experience with them, and didn't know the consequences are of a defect and failure ...to provide ...adequate support." Since it was dealing with a first time computer users, NCR was under a special obligation to be fair with dealing it.

In *Horning* the plaintiff challenged the forum selection clause in a software licenses agreement as unconscionable. The plaintiff was a solo practitioner dentist in a small Kentucky town who purchased a Radio Shack microcomputer. The licensed software was supposed to assist him in compiling financial data, tax records, patient records, and so forth. After the system failed to operate, Dr. Horning filed suit in Kentucky for breach of contract, breach of warranties, negligence, and fraud. The defendant attempted to remove the case to Wisconsin under the forum selection clause of the contract. In denying the defendant's motion, the Court stated:

"While the court cannot say that the defendant has engaged in overreaching, it does regard the clause as bordering on unconscionability as applied to the sale of an important piece of office machinery to a small businessman for the substantial purchase price. In the opinion of the court, there was a disparity of bargaining power with regard to the particular clause of the contract in questions."

The Court further noted that "(t)he forum selection clause is only one of many clauses in the sales contract that together represents the best job of boiler-plating since the building of the Monitor."

Unless the computer industry wakes up and acts responsibly with regards to disclaimers and limitations of liability, it will find itself shackeled with state legislations affecting creation and disclaimers of warranties regarding computers. Such an attempt was already tried this year in California. ●

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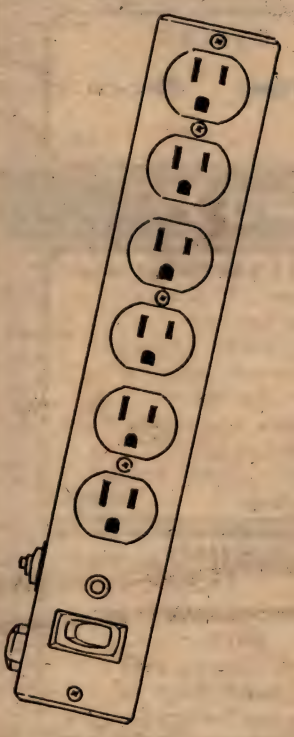

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Complete Turbo Pascal by Jeff Duntemann

A Book Review
by George M. Ewing

In the first year after its introduction on November 15, 1983, Borlund International sold more than 125,000 copies of Turbo Pascal, more copies than all other native-code Pascal compilers put together. The combination of powerful and practical programming features, low cost, and liberal licensing policy for applications programmers and vendors has made it almost unbeatable, the new de facto standard.

The Author

Jeff Duntemann, the author, is one of those rare multiple-threat people who jugle careers as nimbly as The Flying Brothers Karamazov juggle flaming torches and screaming chain saws. Insiders in big business know of him as the brash young English major who took a toolbox-toting repair job at Xerox in Chicago, and worked his way up until in a very few years he was the hotshot systems programmer at Xerox in Rochester, NY. He was sent to Tokyo or Paris when some key internal system crashed or needed upgrading. Hobbyists and hackers know him from his many articles in the amateur radio and computer magazines, and as the president of the small software house that published packages such as the Blaze Pascal (TM) utility programs for Pascal MT+, and numerous other programs for CP/M and MS-DOS. The science fiction community knows him as the author whose stories about artificial intelligence and computing are widely read.

The Book

Before going on with this review, I must point out that I have no intention of claiming to be an authority on Pascal. I am approaching both this text and the compiler itself much as any other beginner. I was a classroom teacher and high school media director for thirteen years, however, and I do think I have a feel for a good (or bad) textbook.

Usually, it is possible to break down software texts into two broad categories: There is the reference manual approach, where all the standards and definitions are listed in a logical fashion, and there is the tutorial or workbook approach, where one is led through the steps, copying existing models. Duntemann has tried to combine these two approaches into a single large, integrated text, and for the most part, he succeeds. The layout of the book is as structured as the programs he is showing the reader how to create.

The book is subdivided into three parts. Part one, "The Ideas of Pascal," is a four-chapter overview, covering the basic tenets of Pascal from Nicklaus Wirth's first version through the release of Turbo, with careful comparisons with MT+ and the basic ISO standard. The author takes a pragmatic and slightly heretical approach: Portability, perhaps the most sacred principal of ISO Pascal, is really secondary to the practical need for a useable, nuts-and-bolts language that can actually accomplish results with the real-world, machine-hook-dependent things like graphics, disk I/O, and so forth. As he says in his introduction, "The purpose of a computer is to get the job done, *whatever* it takes, and lopping off a language's arms and legs for the sake of portability makes no sense at all from a pragmatic point of view."

The second part of the book, "Learning the Language," is the longest, 16 chapters and over 80 sub-sections. It covers in detail how Turbo Pascal works, in both the CP/M 80 and the MS-DOS and CP/M-86 versions. It also explains a long list of ways in which Turbo differs from MT+ and the ISO standard, with the hardware-related reasons for many of the differences. At every step, actual hardware examples are used, not ivory tower theory. He shows you how it's done on an actual machine, such as a Xerox 820 with CP/M, or an IBM running PC-DOS, with warnings where the hardware quirks of a given graphics card make a difference in writing code that will run. He is fanatical about careful backups and lavish use of comments: "Anything which you don't back up, you will eventually lose!" He warns the novice programmer to forget about "clever Hacks and secret tricks" and to "comment the hell" out of your code, as if you were going to drop dead in the middle of every project, and your family's survival depended on clearly understanding what you had written.

The third and final part of the book is dedicated to actually using the compiler. There are 4 chapters and 15 subsections on using the editor, options menu considerations, overlays, and so on. This is followed by three appendices, a list of third party vendors of products supporting Turbo Pascal, (Somewhat limited and out of date by this time) and tables of runtime error messages and I/O error messages.

Evaluation

For the most part, I found this text to be very good indeed. The clarity of the explanations, with hardware reasons for why things will or won't work, are hard to beat. For example, despite my having read quite a bit about 8086 and 8088 computers at the consumer level, this book has the first description of the 16 bit segment-and-offset memory scheme that really made sense to me. This text would make an ideal basis for an intermediate-level programming class, along with Turbo Pascal itself and maybe a copy of *Turbo Tutor*.

Drawbacks

Although I consider *Complete Turbo Pascal* to be a monumental work that should be in every school and public library, as well as on the shelf of everyone trying to learn any

continued on page 180

Table A.
Condensed table of contents for
Jeff Duntemann's Complete Turbo Pascal
(Numbers in parentheses indicate sub-sections; the complete table is four pages long).

Chapter #	Title	Sub-sections
1.	THE PASCAL PROCESS	(4)
2.	THE SECRET IS STRUCTURE	(3)
3.	NESTING AND SCOPE	(1)
4.	PROGRAMMING BY UNDERSTANDING THE PROBLEM FIRST	(2)
5.	IDENTIFIERS AND THE NAMING OF NAMES	(1)
6.	SIMPLE CONSTANTS	(1)
7.	SIMPLE DATA TYPES	(5)
8.	SUBRANGES AND ENUMERATED TYPES	(2)
9.	DATA STRUCTURES	(6)
10.	POINTERS	(5)
11.	OPERATORS AND EXPRESSIONS	(5)
12.	STATEMENTS	(2)
13.	BEGIN AND END	(10)
14.	PROCEDURES AND FUNCTIONS	(4)
15.	HOW TO USE STRINGS	(3)
16.	STANDARD FUNCTIONS	(10)
17.	CONTROLLING YOUR CRT	(4)
18.	CONSOLE, PRINTER, AND DISK I/O	(11)
20.	LOW-LEVEL MACHINE HOOKS	(9)
21.	THE TURBO PASCAL ENVIRONMENT	(1)
22.	USING THE TURBO PASCAL EDITOR	(7)
23.	USING THE TURBO PASCAL COMPILER	(4)
24.	TURBO PASCAL OVERLAYS	(3)
	APPENDICES, GLOSSARY, AND INDEX	

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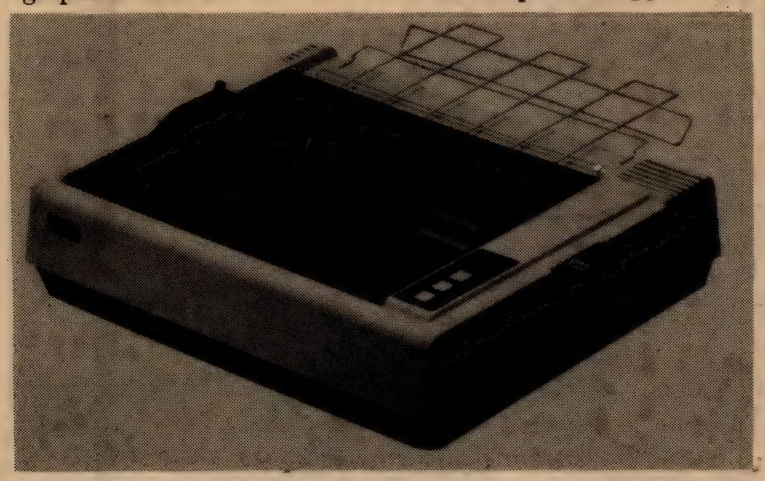

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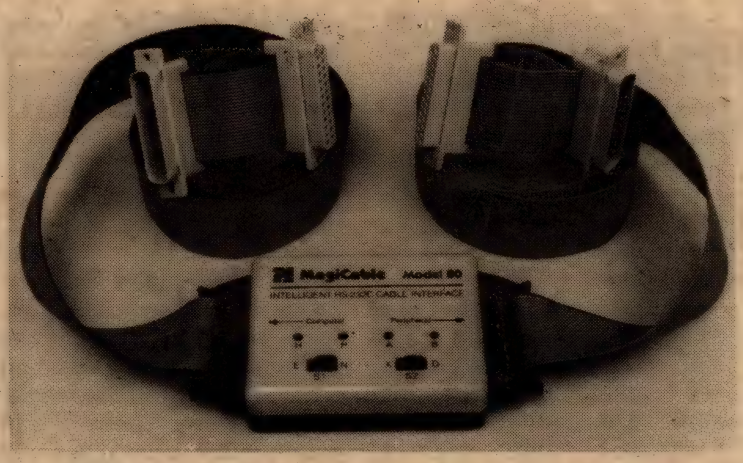

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New Catalog Available

Harbor Electronics of Ridgefield, Connecticut, has announced the publication of a new, twenty-page catalog for the data communications interconnect market.

According to Ingemar L. Sjunnemark, vice president of the company's newly-formed distributed products division, "This catalog marks the beginning of Harbor Electronics' move into the end-user marketplace."

Harbor Electronics was founded in 1976 and has served as an OEM supplier of data interconnects since that time. The distributed products division was formed in July of 1985 to, according to Sjunnemark, "supply end-users with the data and telecommunications products they need at low prices with quick delivery."

Catalogs are available free of charge and may be obtained by writing Harbor Electronics, 650 Danbury Road, Ridgefield, Connecticut 06877; (800) 243-4794, in Connecticut (203) 438-9625.

Mention that you read about it in *Computer Shopper*. ●

Complete Turbo Pascal continued from page 179

sort of microcomputer Pascal, there are some limitations.

For one thing, the book is heavily slanted toward IBM-PC users, which is reasonable given the state of the market, but still a little annoying to CP/M users. Also, much of the book is going to be anything from a few months to a year out of date by the time it gets to the shelves. This is probably unavoidable, but does limit the usefulness of some sections. Borlund announced a 68000 version of Turbo Pascal for the Macintosh some time ago, and versions for the Amiga and ST can't be far behind, but nothing about these can be covered in this text. A hypothetical MacTurbo user next year would still get a lot of useful theoretical information from this book, but all the hardware-specific detail that Duntemann lovingly gives us for the IBM-PC and Xerox 820 would be mostly irrelevant.

I am basing this review on galley proofs, by the way, to avoid further months of delay in getting it out. Bear that in mind, as any discussion of typos is otherwise unfair. The first 18 chapters or so of the galleys were remarkably clean. The last few chapters had noticeably more errors in the actual text. Hopefully, most of these will be caught by the time bound copies of the book are in print. I could not find any errors in the listings and screen printouts in the book, but you'd need an experienced Pascal programmer to spot them in the longer programs, such as the terminal program and IBM graphics superpad program in the later chapters. (The author does spot bugs in the original release of the Turbo Pascal user's manual, by the way, such as incorrect nomenclature in the LONGFILEPOS I/O command.)

One picky detail: All the screen prompts and listings are set in a particularly annoying typeface with a flaky lowercase letter "L" that is especially bothersome. I think they were imitating the stock IBM-PC display font; I don't like that, either! This may seem trivial, but in 458 pages of text that may be used intensively every day for a semester or more, such details matter.

The original working title for this text was "Turbo Pascal from Square One." More realistically, it starts at about Square Three, or maybe Square 2.8. While aimed at the beginner, it does assume a good working knowledge of your computer and operating system, sometimes quite a bit above the total turnkey novice level. It also assumes that the reader has a copy of the language and full time access to a computer, preferably an IBM-PC. This is certainly reasonable for anyone aspiring to be a serious programmer, but may be a little frustrating to a kid who can only scrounge a few class hours a week on a machine at school.

In conclusion, then: This book is a real landmark, and an absolute must for a beginner aspiring to writing serious programs in Turbo Pascal. It also is a first-class reference for the more casual hobbyist who is curious how things work, but may not yet want to lay out the money, and more important, the time, to sit down and become proficient in the language. For this reason, I particularly recommend this book to school libraries and media centers who want to build a good selection of books on programming, but are gun-shy from having been stuck with obsolete and overpriced BASIC or FORTRAN books over the years. Even if you never write a line of code, this volume will be worth having. If you want to program in Turbo Pascal on anything other than a CP/M or MS-DOS machine, you'll still get some good out of this book, but you'll probably want to supplement it.

Complete Turbo Pascal at a glance: (ISBN 0-673-18111-1).

Publisher: Scott, Foresman and Co., Glenview, Illinois.

Author: Jeff Duntemann.

Type of Book: Comprehensive textbook for programming in Borlund International's Turbo Pascal compiler.

Length: 24 chapters, 458 pages, including appendices.

Release: Copyright 1986.

Price: Scheduled at about $20.00. ●

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MC68020 Based, 32-Bit Single-Board Computer

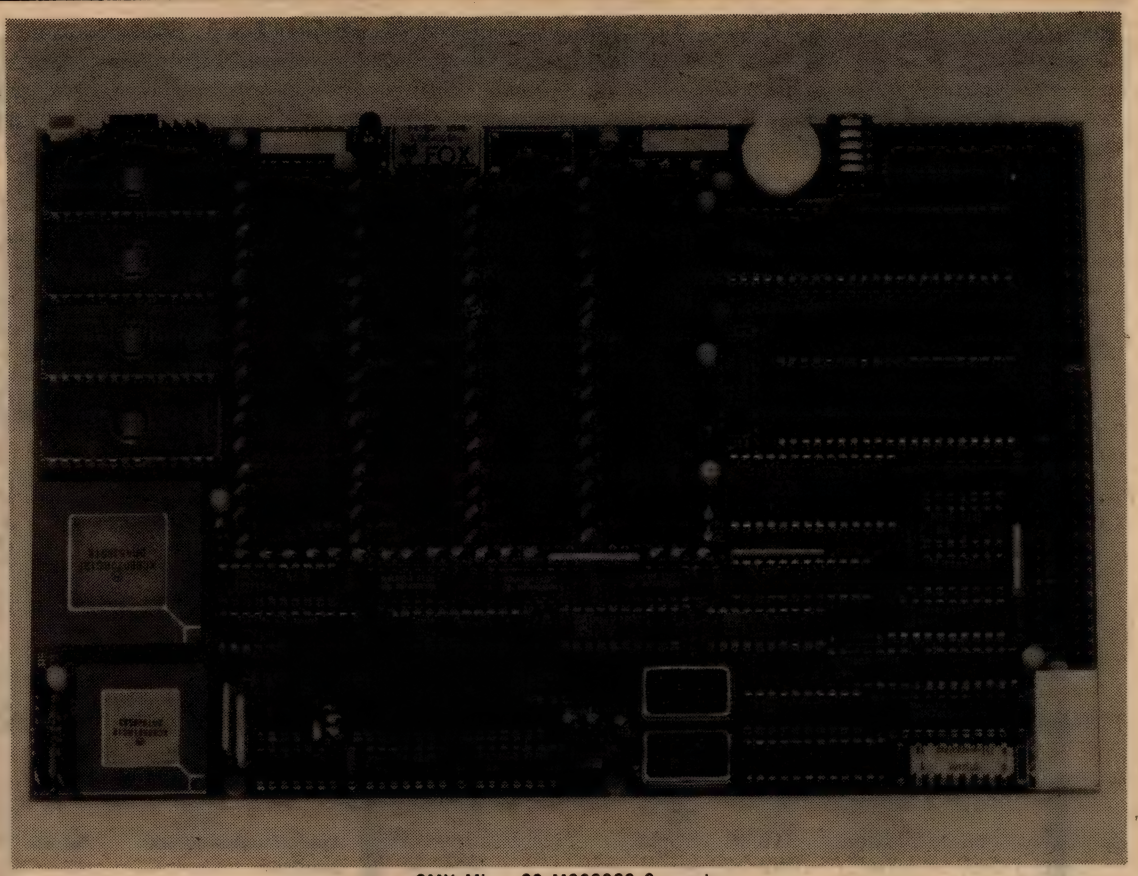
GMX Inc. is proud to announce the availability of the GMX Micro-20, the first in a family of 32-bit MC68020 based single-board computers and related products. The GMX Micro-20 SBC combines a Motorola MC68020 32-bit microprocessor and an optional MC68881 floating-point coprocessor with: 2 Megabytes of 32-bit wide RAM, up to 256K bytes of 32-bit wide EPROM, four serial ports, an 8-bit parallel port, a 5.25" floppy disk controller, a SASI peripheral interface, a time-of-day clock with battery backup. A 16-bit expansion connector allows the addition of off-the-shelf or custom I/O interfaces.

The board, measuring only 8.8" x 5.75", mounts on and uses the same power connector and supply voltages as a standard 5.25" disk drive. Power requirements are +5 VDC at 4.5A max., and +12 VDC at 125Ma. A separate board, included with the GMX Micro-20, provides RS-232 level translation and 4 DB-25 type connectors for the serial ports. A DC-to-DC converter supplies the necesary -12 volts.

The price of the GMX Micro-20, in lots of 25, is $2200.00. Delivery is from stock to 30 days ARO.

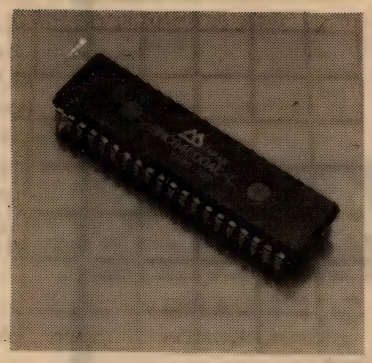
The price includes Motorola's 020Bug monitor/debugger and a full set of hardware diagnostics in PROM. A PROMable, real-time, multi-user/multi-tasking operating system is optional. Planned additions to the GMX Micro-20 family include a version with hardware memory management, standard and intelligent serial I/O expansion boards, and a color graphics interface. System packages, with cabinet, power supply, and floppy/hard disk drives are also available.

For additonal information contact GMX Inc., 1337 W. 37th Place Chicago, IL 60609; (312) 927-5510.



GMX Micro-20 MC68020 Computer

CMOS Z80 CPU From S-MOS Systems



S-MOS Systems of San Jose is now shipping a family of CMOS microprocessors based on Zilog's Z80 central processing unit. The three new devices include one with a low power "sleep" mode, and one with an on-chip oscillator, and one that is 100% plug-compatible with the NMOS Z80.

The SMC 84COOAC-L is pin-for-pin compatible with the Z80, but because of the added "sleep" mode feature, the device does not support an on-chip dynamic memory refresh counter. The 40-pin part is especially suitable for hand-held, portable or remote control applications.

The 42-pin SMC 84COOAC-S has an on-chip oscillator in addition to the sleep mode. The SMC 84COOAC, without the sleep mode or oscillator, is a pin-for-pin Z80 compatible microprocessor.

Seventy-eight of the SMC 84COO's instructions are for the 8080A, thereby maintaining compatibility with Z80 and 8080 software.

The devices has 208 bits of read/write memory in its internal registers that the programmer can access. Two sets of six general purpose registers may be used individually as either 8 bit registers or as 16-bit register pairs, background/foreground programming and single level interrupt processing.

The SMC 84COO microprocessor, AC version, sells for $2.92; the AC-L version $3.25; the AC-S version $3.25 in 1,000 quantities.

For more information, contact: S-MOS Systems, 50 W. Brokaw Road, Bldg. 7, San Jose, CA 95110., Tel. (408) 993-1212

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Special Applications Supplied by Dataproducts

Two net printer ribbons and a printwheel were introduced recently by Dataproducts Supplies Division, a leading printer supplies manufacturer. These new products, compatible with printers from Dataproducts and Epson, represent products for more than 200,000 printers in operation throughout North America.

Two of these new products serve the specialized MICR (Magnetic Ink Character Recognition) printer market for financial applications. Dataproducts is a printer supplier in this fast-growing MICR market which demands very high quality printout onto checks. Since the checks are then machine-read, very reliable, magnetic images are required. These two MICR products are:

* The Dataproducts CP-40 MICR (Magnetic Ink Character Recognition) ribbon for the Dataproducts CP-40 MICR printer and CP-1800 check printing system. This ribbon is also compatible with the Diablo Hy-Type II MICR printers. Suggested retail price is $108 per 12-pack; part number is 275115.

* A new printwheel for the CP-40 MICR printer is universal dual plastic and includes both E13B and CMC7 character sets. E13B is the U.S. check printing typestyle while CMC7 is used in Europe and South America. This printwheel can be ordered under part number 275015 and retails for $24.95.

Additionally, Dataproducts introduces:

* The Epson LQ-1500 nylon cartridge ribbon for the Epson LQ-1500 dot matrix printer. Suggested retail price is $95.00 per 12-pack; part number is 312156.

All supply items are guaranteed defect free and guaranteed fresh for one full year.

These products are available through Dataproducts Supplies Divisions' more than 2000 distributors. To order supplies, call your local Dataproducts Supplies distributor or for more information, call 1-800-423-5095 outside California, or 818-887-8353 inside California. ●

Q-4220 RS-232/RS-422 Protocol Converter

Quasitronics has announced that it will make first shipments of the Q-4220 **RS-232/RS-422 Converter.**

The RS-232/RS-422 Converter is a device that provides bidirectional synchronous or asynchronous conversion of all commonly used RS-232 and RS-422 signals.

Each port is jumper configurable for DTE or DCE operation. The unit is designed to be configured with one port set as DTE and the other port set as DCE.

The price for the Q-4220 **RS-232/RS-422 Converter** is $219.00.

For more information contact: Quasitronics, Inc., Vice President, Sales, 211 Vandale Drive, Houston, PA 15342. 1 (800) 245-4192.

Mention that you read about it in *Computer Shopper.* ●

STSC Awards Over $7,000 In Application Story Contest

STSC, Inc., announced recently at COMDEX the eight winners of more than $7,000 in cash and prizes awarded in STSC's Application Story Contest.

The winning applications were all developed using STSC's PLUS*WARE products, and were selected based on originality and usefulness of application. The contest was designed to focus attention on the strengths and versatility of STSC's decision support systems and on the talents of the professionals using them.

The first place winner was Dr. Barbara Hynes, director of nursing at Marist College Poughkeepsie, New York, who used STSC's APL*PLUS PC System to develop an interactive nursing simulation. The application was designed to help train nursing students by simulating critical patient situations. As a result, students are able to practice emergency care situations and see the consequences of their decisions.

According to Dr. Hynes, Marist College evaluated a number of computer-based learning products in languages other than APL, but none had the range and flexibility needed for a simulation system.

"We chose APL*PLUS PC because the product allows development of application in a fraction of the time other languages would take," Dr. Hynes said. "Modification is easier and faster. Plus, the power of the language, the quality 'tools' of STSC, and the company's HELP-line service were all major considerations."

The other winning applications span a broad range of disciplines, from business management, manufacturing, and education, to complex technical and scientific fields such as genetic research.

The top three winners in the contest received cash awards and a choice of a PC PLUS*-WARE product.

PLUS*WARE products used by the winning developers include APL*PLUS PC System, an advanced application development system; Pocket APL, a complete implementation of the APL programming language; and STATGRAPHICS, a comprehensive statistical analyses package with interactive color graphics.

STSC, a Contel company, provides productivity tools and decision support software internationally through its APL Products and Services and Logistics Decision Systems divisions. The company has branch offices nationwide and licenses software through distributors worldwide.

The APL Products and Services business unit, an industry leader in the development of the APL programming language, delivers APL-based software in the microcomputer and mainframe environments, and publishes micro software in the microcomputer and mainframe environments, and publishes micro software written by independent developers.

For additional information contact STSC, Inc., 2115 East Jefferson Street, Rockville, MD 20852; (301) 984-5000.

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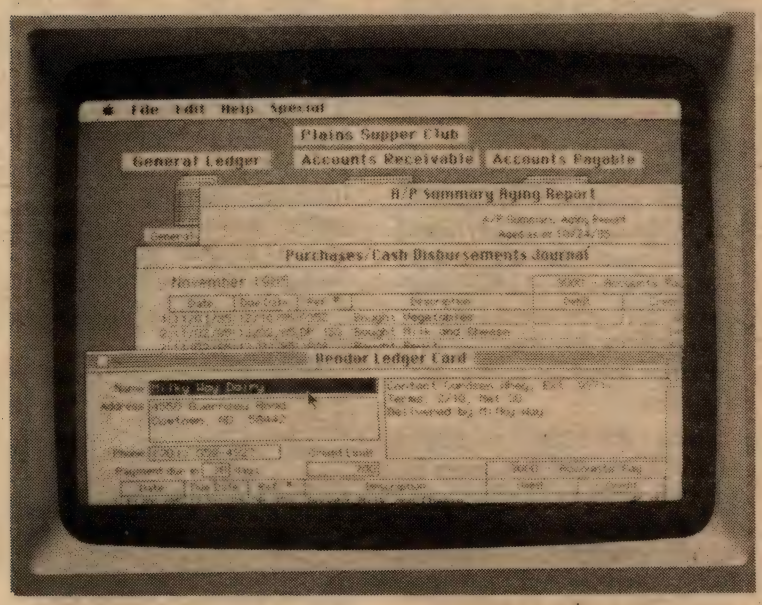
'Plains & Simple'™ Accounting Package For Macintosh



A software package that emulates the widely used manual "one-write" bookkeeping and accounting system was introduced for the Apple Macintosh computer recently by Great Plains software of Fargo, North Dakota. During COMDEX, Great Plains' new accounting software package can be seen at the Apple Computer booth, #2560, in the main hall of the Las Vegas Convention Center.

Called "Plains & Simple"™, the package automates the general ledger, accounts receivable and accounts payable functions found in nearly five million businesses using manual one-write systems. The familiar one-write system is graphically reproduced on the Macintosh screen so one-write customers will instantly recognize the entry screens and "forms."

This familiarity, combined with special features used throughout Plains & Simple such as extensive on-line help, allow customers to convert their accounting from manual to automated with ease.

"We recognize that some of the resistance to purchasing software is due to the training and set up time required by the customer. Plains & Simple solves this by so closely emulating manual one-write systems that it allows the customer to transfer his or her accounting from pen to keyboard virtually overnight,"said Douglas Burgum, president of the four and one-half year old software company.

"Plains & Simple combines the proven set of a manual one-write system with the ease of use of the Apple Macintosh. The result is an accounting product that will be incredibly easy for customers to learn and use," Burgum said.

Guy Kawasaki, software products manager for Apple Computer, said, "Great Plains' Plains & Simple is a valuable addition to the collectin of Macintosh business management power tools. Because it recreates the familiar one-write system, it lowers the learning time barrier and makes the power of the Macintosh accessible to small businesses — immediately."

According to Plains & Simple product manager Thor Iverson, the software is designed to have the customer up and running the same day it is received. Even if the customer has never used a computer or manual one-write system before, he will find Plains & Simple easy to learn.

"Plains & Simple includes general ledger, accounts receivable and accounts payable all in one package. The product was designed to be three-in-one from the start to save time and add simplicity. In fact, customers can have information available from all

continued on page 184

T & S Computer Products, Inc.
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Dear PC User:

T & S Computer Products, Inc., is offering two memory systems for IBM* and IBM* Compatible PC's.

The first, is a multifunction board with 384K of memory. The other is a 512K memory only card.

We add top quality 150ns memory chips to these cards, and then test them so that you the user are insured the highest level of integrity and operability. We are so confident that we are including a 14 month Parts and Labor guarantee (from day of shipment).

All that is left for you to do is plug the board in, and set a few dip switches so that your computer knows how much memory is in the system.

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384K multifunction card	$199.00
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Remember all cards are assembled and tested, and price includes shipping and handling. All orders come with complete documentation. We also include RAM Disk and Print Spooler software with each order at no extra charge.

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Sincerely,

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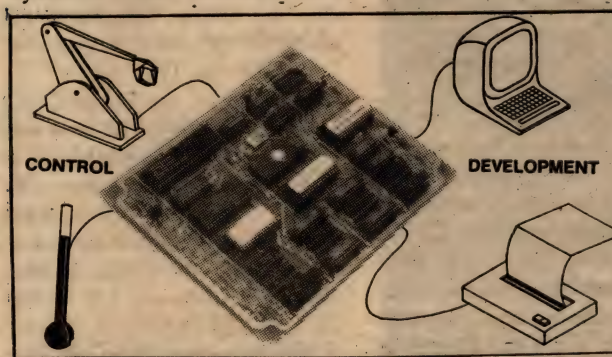

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'Plains & Simple'™ continued from page 183

three functions on the screen at the same time," he added.

Great Plains reported one-write systems are used in virtually every type of small business. However, manual one-write systems are found in the offices of dentists, physicians, lawyers and accountants more often than any other manual accounting method. The many small businesses that use manual one-write systems are the primary customers for a Macintosh-based one-write system, the company revealed.

Plains & Simple can pay for itself within a matter of months, the software company stated. For example, a customer could reduce or completely eliminate costs for service bureaus, forms, statement preparation and write-ups. The software will also allow accountants and CPAs to spend more time on financial review and analysis.

Plains & Simple carries a suggested retail price of $695. The package includes a general ledger, accounts receivable and accounts payable functions. Through these three functions the customer can access the general journal sales/cash receipts journal, purchases/cash disbursements journal, customer and vendor ledger cards and reports.

Plains & Simple provides summary and detailed balance sheets and income statements, a trial balance, summary and detailed aging reports, customer statements, customer and vendor lists, mailing labels and telephone cards.

Plains & Simple allows customers to:

- Retain transaction detail for as long as they desire
- Maintain complete customer and vendor information
- Post all transactions automatically to the proper accounts in the general ledger
- Print checks
- Set up multiple companies
- Restrict posting if entries are out of balance
- Monitor customer credit limits
- Manage prepayments and returns
- Print financial statements at any time during the year
- Select accural or cash-basis accounting

A new feature to accounting software is a Cash-Flow Calendar which at a glance permits customers to project future positions based upon their anticipated incoming and outgoing cash flows.

Plains & Simple™ requires a 512K Macintosh computer with a second disk drive and Imagewriter or compatible printer. A hard-disk configuration is recommended. Shipment of the product will begin in late November.

Great Plains Software also manufactures and markets the Hardisk™ Accounting Series, a leading accounting software package for microcomputers. Modules include general ledger, accounts receivable, accounts payable, payroll, inventory management with point of sale invoicing, and job cost.

The Hardisk™ Account Series is available in both single- and multi-user editions. The software runs on most leading microcomputers including IBM PC, IBM XT, IBM PC AT, Apple //e, Apple Macintosh, Texas Instruments, Tandy, Wang, Apricot, Compaq and all 100-percent IBM compatibles.

Great Plains Software a licensed developer of software for the Apple Macintosh, was founded in 1981 and is headquartered in Fargo, North Dakota.

For further information contact: Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58109 (701)281-0550

Mention that you read about it in *COMPUTER SHOPPER*. ●

The Sinclair QL continued from page 80

capabilities of the QL which allows up to 64 QL's to be networked by simply plugging them together.

Much has been said about Sinclair's Microdrives, the continuous micro tape loop storage system, two of which are built into the QL. Although tiny in size, (about an inch and a half square), they will hold up to about 50 files or 100K per cartridge. Depending on the length of the program, load time is 10 to 20 times faster than a typical cassette system and in fact the data transfer rate is a little faster than a floppy disk. At any rate, it should be mentioned that no less than 3 new floppy disk interface systems have been released in the last 6 months for the QL, the most expensive retailing for $199.00.

Regarding the QL's video presentation and aesthetics, the monitor port provides very high resolution in two modes: 512 x 256 pixels in four colors, (or scales of grey in monochrome); or 256 x 256 pixels in eight colors or scales of gray. Column formats are determined by the number of pixels, but a choice is available; normal format is 85 columns by 25 rows.

The QL comes with 128K RAM, but is expandable to 640K for an extra $250.00. Hard-drives are also available ranging from 10 to 40 megabytes, a decided plus when using the networking

The appearance and finish of the keyboard bears no resemblance to any preceeding Sinclair product. Finished in matte black, the QL keyboard is a full-sized QWERTY board with 65 keys, including shift keys where you would expect to find them, five function keys and four separate cursor control keys.

Two RS-232C standard communications interfaces for printer, modem or other compatible peripherals are included along with TV, Monitor, ROM cartridge and Expansion slots. The RS-232C ports transmit from 75 to 19,200 baud. Or, transmit/receive in full duplex at seven rates up to 9600.

There are also two joystick ports and the port for the Local Area Network, (QLAN), for the hardwire networking of 2-64 QL's. When networking, data travels through the network at 100K baud.

The advantage of the QL taking so long to come to market, is that others have had a chance to catch up, and this is the case with the QL's third party support.

Apart from the fact that Sinclair includes a suite of four programs covering essential user needs, much new software is available already. Ranging from entertainment and adventure to abundant language support and nitty-gritty workhorse programs such as project planners and decision software, the new list of software is growing at an astounding pace.

Released last month is a ROM cartridge called ICE, (Icon Controlled Environment), which presents the user with a desktop environment from which all QDOS functions are controlled. The mouse, joystick or cursor key driven arrow accesses everything from the calculator and calendar to import/export and ram-disk control. Included with ICE is utility software to handle multi-tasking, RAM drives, mailmerge and card file indexes.

QL distributor, Foundation Systems, (a division of Ramex International), have compiled an extensive list of QL peripherals and third party software.

One of their fastest moving items is the ICE package mentioned above. They have advised us that during the initial introduction of the QL, they are including the ICE pack free, ($100.00 retail), when they ship QL's at the already reduced $299.00 price.

Warranty service will be provided by EMF at 60 Foundry St., Keene, NH, who will also offer extended service contracts for the QL.

Supplies of the Micro Drive Wafers are plentiful and will continue to be available.

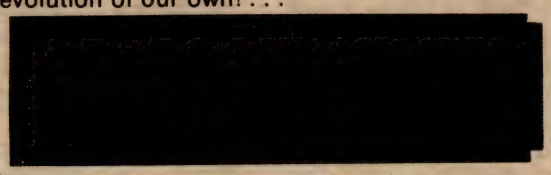
Enquiries regarding purchases or further information should be addressed to: Foundation Systems, 17620 26 Mile Rd., Washington, MI 48094. Or call 313-781-5800.

Mention that you read about it in *Computer Shopper*. ●

THE REVOLUTION CONTINUES

THE SINCLAIR QL . . . . . ARRIVES!

People are already starting to find out about this remarkable new computer from Sinclair, at Foundation Systems, we decided to have a revolution of our own! . . .

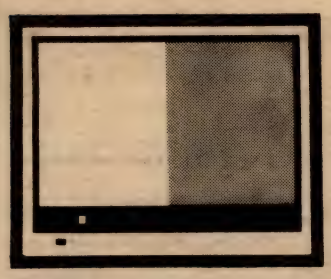


The QL Features:

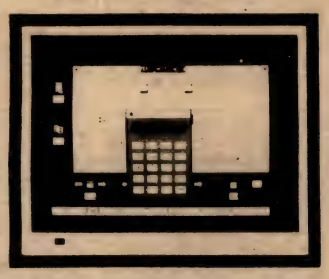
• 32 bit 68008 microprocessor • 128K ram std. • expands to 640K • 2 microdrives • 2 RS-232 ports • 12 x 256 color • MONO and RGB video

Comes With:

• QL Word Processing • QL Spreadsheet • QL Graphics • QL Database • Full sized keyboard • Multitasking • LAN network capability



The QL from anyone else for $299.00



The QL from Foundation Systems for $299.00 with FREE ICE!! (Icon Controlled Environment)

ICE is a ROM based powerful desktop utility for the Sinclair QL. ICE simplifies all QL housekeeping procedures by replacing extensive BASIC and QDOS commands with an easy to understand ICON driven screen that represents your desk, with pictures of the things you would expect to find such as a working calculator, calendar and clock.

Powerful folder features allow you to take actions on many files at once. You can handle Loading, Saving, Directories, Import and Export, manipulate files or be rid of them forever by dumping them in where else?, but the Garbage Can! The ICE package, (a $100.00 value), is included FREE!! when you buy your QL from Foundation Systems.

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Trivia Mania

by Jeff Brenner

The phenomenol success of the board game, Trivial Pursuit, has spawned hundreds of imitations and spinoffs, and for good reason: Trivia has been synonymous with big-bucks over the past two holiday seasons and everybody is trying to grab a share of the trivia market. Software manufacturers are no exception, and one of the newest entries into the computer trivia genre is *Trivia Mania*, from XLENT software.

As with most trivia games, the object of *Trivia Mania* is to score the greatest number of points by answering questions that exist mainly for the purpose of being answered. Unlike other trivia computer games, though, such as Suncom's *Pary Quiz, Trivia Mania*, which bills itself as "The Trivia Construction Set," lets you create your own trivia questions and answers. Sadly, however, this nice feature by itself does not compensate for this program's lack of playability.

The Game

Included in the software package are two double-sided diskettes. The first diskette contains the main program on one side and a trivia databases on the other. The second diskette contains two additional database, one on each side.

The trivia databases contain material covering six categories: general trivia, sports trivia, movies trivia, television trivia, commercials/ads trivia and science trivia. Each database contains 100 questions per category. Three databases and six categories give you a total of 1800 questions.

Questions are chosen randomly from the database of a particular category. Before questions are given, you can choose to have the correct answer displayed when a question is answered incorrectly. The questions themselves are not the challenging, really-search-your-memory type that you would find in a Trivial Pursuit game. Rather, most of the questions in the *Trivia Mania* databases deal with contemporary facts, and real trivia-buffs may be disappointed. Following are some typical questions:

Q. Snatches and clean jerks sports:
1) Weight Lifting
2) Housekeeping

continued on page 190

Applying The Atari

continued from page 70

be programmed to "hold" up to 24 characters. This feature is ideal for plans that repeat often during the month or year. For example, if you play tennis every Thursday, you could define CONTROL-A to be "8:30 PM Tennis club." Then, when entering appointments for any Thursday, you could press CONTROL-A and "8:30PM Tennis club" will be added to the screen. You could also define other keys for "Pay bills," "10:00AM Chemistry Class," etc.

Important Entries

As mentioned briefly last month, you can place an asterisk (*) at the beginning of any appointment line on the PACE Appointment Display, and you will be reminded of that appointment when it is within seven days away. Such plans will be displayed on the "Upcoming Important Entries" screen that follows the "Tomorrow's Appointments" display. This feature is perfect to use with birthdays, deadlines, or any other dates for which you would need a reminder several days in advance.

Setting the Year

When setting the present date or choosing a date to enter appointments, the display shows the year 1985 and can be moved up to 2000 with the OPTION key. To make the program start by displaying 1986, change line 30 to:

```
30 MIN = 1986
```

This will save you from having to press the OPTION key to change the year each time you enter the date. The original program started with 1985 since most *COMPUTER SHOPPER* subscribers received the January 1986 in 1985. Next year you could change this line to MIN = 1987, and so forth.

Since the program uses 366 records, a particular day of any year is stored in a record for that day. Hence, February 15, 1986 and February 15, 1987 are the same record. It is still possible however, to make appointments for more than one year in advance. In this case, you either label a line of February 15, 1986 screen "1987:." Then when PACE cycled back around the February in the year 1987, you could delete the 1986 data and make note of the 1987. Or, you can use a completely different data diskette that you could label, "1987."

Instant Alphabetizer

This month's feature program is a data alphabetizer that uses a machine language sort for super fast operation. The program also allows you to save and load alphabetized lists to and from diskette or cassette, delete items from an alphabetized list, add items to the list, or print the alphabetized list on the printer.

A similar type of program was the subject of the very first "Applying The Atari" column (August 1984), but this program took a very long time to alphabetize, save or load data.

continued on page 186

NEW *TRS-80 Model III Application

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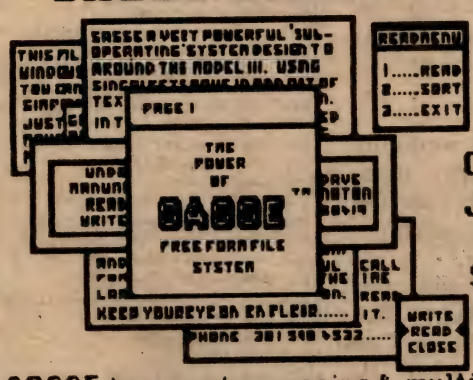

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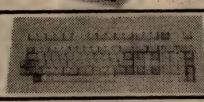

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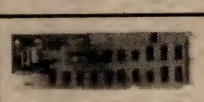

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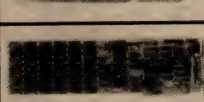

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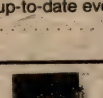

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Instant Alphabetizer continued from page 70

```
XCJ 420 IF LEN(IN$)<LN THEN IN$(LEN(IN$)+1)=SP$
QRJ 430 DAT$(C*LN-LN+4,C*LN+3)=IN$
AFJ 440 NEXT C:PRINT "MAXIMUM ITEMS REACHED.":GOTO 470
YVJ 450 C=C-1:IF C>1 THEN A=USR(ADR(ABC$),ADR(DAT$)+3,C,LN)
YWJ 460 GOTO 90
SLJ 470 C=C-1:A=USR(ADR(ABC$),ADR(DAT$)+3,C,LN):GOTO 500
OQJ 480 POKE 85,4:PRINT "PRESS CONTROL-1 TO PAUSE/CONTINUE"
XQJ 490 PRINT :FOR I=1 TO C:PRINT I;":";CHR$(32);DAT$(I*LN-LN+4,I*LN+3):NEXT I
MDJ 500 PRINT :POKE 85,9:PRINT "PRESS <RETURN> FOR MENU";:POKE 764,255
TSJ 510 GET #1,N:GOTO 90
RCJ 520 PRINT "PRINT WITH NUMBERED LINES (Y/N)?";:GET #1,N:PRINT CHR$(N)
SYJ 530 SKIP=0:IF N=78 THEN SKIP=1:GOTO 550
VFJ 540 IF N<>89 THEN 520
XDJ 550 PRINT "TURN PRINTER ON AND PRESS <RETURN>":POKE 764,255
NQJ 560 GET #1,N:OPEN #3,8,0,"P:":PRINT #3:FOR I=1 TO C
XBJ 570 IF SKIP=0 THEN PRINT #3;I;":";CHR$(32);
PAJ 580 PRINT #3;DAT$(I*LN-LN+4,I*LN+3):NEXT I:PRINT #3:GOTO 90
JFJ 590 PRINT "LOAD FROM CASSETTE OR DISK (C/D)";
QCJ 600 GET #1,N:PRINT CHR$(N):IF N=67 THEN D$="C:":I=128:GOTO 650
TGJ 610 IF N<>68 THEN 90
EIJ 620 I=0:D$="D:":PRINT "ENTER FILENAME: ";:INPUT #16;IN$
SEJ 630 IF IN$(2,2)=":" OR IN$(3,3)=":" THEN D$=IN$:GOTO 650
SLJ 640 D$(LEN(D$)+1)=IN$
QYJ 650 POKE 881,0:OPEN #3,4,I,D$:POKE 889,255
VPJ 660 H=INT(ADR(DAT$)/256):L=ADR(DAT$)-H*256:POKE 885,H:POKE 884,L
YWJ 670 POKE 882,7:A=USR(ADR(IO$),48)
JHJ 680 LN=ASC(DAT$(1)):H=ASC(DAT$(2)):L=ASC(DAT$(3))
CRJ 690 C=L+256*H
TDJ 700 PRINT "DATA HAS BEEN LOADED":CLOSE #3:GOTO 500
OLJ 710 IF C<=1 THEN PRINT "ONLY ONE ITEM IN MEMORY":GOTO 500
KSJ 720 PRINT :PRINT "ENTER NUMBER OF ITEM TO REMOVE OR 0"
EKJ 730 PRINT "FOR MENU: ";
DIJ 740 TRAP 90:INPUT #16;NUM:IF NUM<=0 THEN 90
AKJ 750 IF NUM>C THEN PRINT "NO SUCH NUMBER - USE DISPLAY OPTION":GOTO 500
SCJ 760 PRINT "ITEM #";NUM;" IS: "
MFJ 770 PRINT DAT$(NUM*LN-LN+4,NUM*LN+3)
VRJ 780 PRINT "SURE YOU WANT TO DELETE THIS (Y/N)";:GET #1,N:PRINT CHR$(N)
VNJ 790 IF N<>89 THEN 710
EZJ 800 IN$(1)=CHR$(255):IN$(257)=CHR$(255):IN$(2)=IN$
IOJ 810 DAT$(NUM*LN-LN+4,NUM*LN+3)=IN$:A=USR(ADR(ABC$),ADR(DAT$)+3,C,LN)
JVJ 820 C=C-1:PRINT "THAT ENTRY HAS BEEN REMOVED.":GOTO 500
ECJ 830 PRINT "SAVE TO CASSETTE OR DISK (C/D)";
QOJ 840 GET #1,N:PRINT CHR$(N):IF N=67 THEN D$="C:":I=128:GOTO 890
TMJ 850 IF N<>68 THEN 90
YYJ 860 I=0:D$="D:":PRINT "FILENAME TO SAVE UNDER: ";:INPUT #16;IN$
SQJ 870 IF IN$(2,2)=":" OR IN$(3,3)=":" THEN D$=IN$:GOTO 890
SRJ 880 D$(LEN(D$)+1)=IN$
NHJ 890 H=INT(C/256):L=C-H*256:DAT$(1,1)=CHR$(LN):DAT$(2,2)=CHR$(H)
TGJ 900 DAT$(3,3)=CHR$(L)
```

Applying The Atari continued from page 185

It also did not provide for deleting entries from the alphabetized list. A question from reader John M. Hirsch (Normal, IL) who asked how to delete entries from the August 1984 program inspired me to create a vastly superior version. With Instant Alphabetizer, alphabetization takes a few seconds at most, data is saved to or loaded from the disk drive or cassette much faster, and a delete function has been implemented. Now you can get those names, book titles, record albums, computer programs, etc. in alphabetical order more efficiently than ever.

Use Program Perfect to enter the program under the "Instant Alphabetizer" heading. When you run the program, a menu will appear with the following options: Enter new listing to be alphabetized, Load a previously saved list, Display the alphabetized list on screen, Print the alphabetized list on the printer, Add items and re-alphabetize, Remove items from list, Save alphabetized list.

When you use the program for the first time, you'll want to use the "Enter new list" function, so press E. Depending upon the memory of your machine, you will be able to enter a certain number of lines of 38 characters each to be alphabetized. A 48K or 64K Atari can handle over 600 entries of 38 characters each, which is probably more than you'll ever need. If you do need more entries, you can make the size of each entry smaller by changing the value of LN on line 40 from 38 to a lower value. For example, if you want to enter twice as many items, change line 40 to:

LN = 19

You will now have a maximum of 19 characters per item. Similarly, you can increase LN if you need more characters per item but fewer items.

Enter each item and press RETURN on a blank line when done. Your list will be alphabetized and you'll be brought back to the menu screen. You can now save the data to cassette or diskette by pressing S.

Once an alphabetized list is in memory, you can press D to display the list on the screen, or you can press P to print it on your printer. When displaying on the screen, each item will be numbered so that you may refer to it if you want to delete it from the list. When you print the list to the printer, you'll be asked if you want to number each entry. Type Y if you want the entries to be numbered.

continued on page 187

```
SZJ 910 POKE 881,0:OPEN #3,8,I,D$:PRINT #3;DAT$(1,C*LN+10)
GOJ 920 REM H=INT(ADR(DAT$)/256):L=ADR(DAT$)-H*256:POKE 885,H:POKE 884,L
HCJ 930 REM H=(C*LN+10)/256:L=(C*LN+10)-H:POKE 889,H:POKE 888,L
LNJ 940 REM POKE 882,11:A=USR(ADR(IO$),48)
RIJ 950 CLOSE #3:PRINT "DATA HAS BEEN SAVED":GOTO 500
GKJ 960 H=PEEK(84)
HGJ 970 POKE 702,64:POKE 694,0
YGJ 980 POSITION 2,H:PRINT "SELECT: ";CHR$(32);CHR$(126);
IIJ 990 GET #1,N:PRINT CHR$(N);:RETURN
ROJ 1000 SOUND 0,50,6,4:FOR I=1 TO 50:NEXT I:SOUND 0,0,0,0:RETURN
WAJ 1010 PRINT "ERROR #";PEEK(195);" AT LINE ";PEEK(186)+256*PEEK(187)
SXJ 1020 PRINT "TYPE ";CHR$(34);"CONT";CHR$(34);" TO RECOVER.":CLOSE #3:STOP
BMJ 1030 GOTO 90
NTJ 1040 DATA 104,104,133,204,104,133,203,104,133,212,104,133,211,104,104,133
LGJ 1050 DATA 209,165,203,133,207,165,204,133,208,162,0,134,210,134,213,232
JLJ 1060 DATA 165,207,133,205,24,101,209,133,207,165,208,133,206,105,0,133
CVJ 1070 DATA 208,160,0,177,207,209,205,240,4,144,9,176,27,200,196,209
OLJ 1080 DATA 176,22,144,239,164,209,132,210,136,177,207,133,214,177,205,145
JTJ 1090 DATA 207,165,214,145,205,136,16,241,232,208,2,230,213,228,211,208
JIJ 1100 DATA 191,165,212,197,213,208,185,165,210,208,166,96
BKJ 1110 PRINT CHR$(125);"STAND BY..."
UCJ 1120 FOR I=1 TO 108:READ N:TOT=TOT+N:ABC$(I,I)=CHR$(N):NEXT I
WLJ 1130 IF TOT<>17407 THEN PRINT "CHECK DATA LINES 1040-1100":STOP
SYJ 1140 DATA 104,104,104,170,76,86,228
LLJ 1150 FOR I=1 TO 7:READ N:IO$(I,I)=CHR$(N):NEXT I
DKZ 1160 RETURN
```

HALLEY'S COMET PROGRAM

```
YUJ 10 REM HALLEY'S COMET PROGRAM
CIJ 20 REM ORIGINAL PROGRAM BY ROGER BROWNE
NJJ 30 OPEN #2,4,0,"K:"
BIJ 40 DIM CO$(15),SP$(20),DT$(20),DA$(40)
XIJ 50 SP$(1)=CHR$(32):SP$(20)=CHR$(32):SP$(2)=SP$
WBJ 60 DT$(1)=CHR$(46):DT$(20)=CHR$(46):DT$(2)=DT$
TEJ 70 DA$(1)=CHR$(45):DA$(40)=CHR$(45):DA$(2)=DA$
IQJ 80 PI=3.14159265
ANJ 90 CO$="COMET HALLEY"
EGJ 100 PH=1986.11
DVJ 110 PL=170.011
DZJ 120 AN=58.1453
EWJ 130 PY=76.0081
EVJ 140 SM=17.9435
GOJ 150 EO=0.967267
EJJ 160 ID=162.239
IJJ 170 GRAPHICS 0
SLJ 180 PRINT CHR$(125);:POKE 85,14:PRINT CO$:POSITION 20,0:PRINT CHR$(255
XZJ 190 FOR I=1 TO 18:PRINT CHR$(45);CHR$(32);:NEXT I:PRINT CHR$(45)
CPJ 200 POKE 85,11:PRINT "EPHEMERIS FOR DATES"
XYJ 210 POKE 85,10:PRINT "BETWEEN 1946 AND 2026"
XFJ 220 POKE 85,13:PRINT "by Roger Browne":PRINT
GBJ 230 PRN=0:PRINT "INPUT YEAR: ";:INPUT #16;Y
UCJ 240 IF Y<1946 OR Y>2026 THEN 230
SHJ 250 PRINT "INPUT MONTH: ";:INPUT #16;M
JCJ 260 IF M<1 OR M>12 THEN 250
LOJ 270 PRINT "INPUT DAY: ";:INPUT #16;D
OWJ 280 PRINT CHR$(125);:POSITION 15,10:PRINT "CALCULATING..."
TEJ 290 X=PH
IQJ 300 IF Y>=1986 THEN Z=1984
GKJ 310 IF Y<1986 THEN Z=1988
CBJ 320 IF Y>=1986 THEN S=0
YSJ 330 IF Y<1986 THEN S=1
GFJ 340 GOSUB 1720
SQJ 350 DS=N
BBJ 360 B=(360/PY)*(N/365.25)
PIJ 370 K=B
GNJ 380 GOSUB 1850
ISJ 390 B=(K*PI)/180
QWJ 400 E=B
USJ 410 Y1=EO
VIJ 420 Q=E-(Y1*SIN(E))-B
RKJ 430 IF ABS(Q)<=1.7E-05 THEN 470
YJJ 440 U=Q/(1-(Y1*COS(E)))
UEJ 450 E=E-U
BPJ 460 GOTO 420
XCJ 470 V=(SQR((1+Y1)/(1-Y1))*(SIN(E/2)/COS(E/2)))
GZJ 480 V=2*ATN(V)
LVJ 490 V1=(V*180)/PI
AMJ 500 L=V1+PL
XJJ 510 R=SM*(1-(Y1*Y1))/(1+Y1*COS(V))
WQJ 520 F=L-AN
UHJ 530 F2=IO
KLJ 540 F1=(F*PI)/180
MLJ 550 F2=(F2*PI)/180
AXJ 560 I=(SIN(F1)*SIN(F2))
EIJ 570 I=ATN(I/SQR(-I*I+1))
GFJ 580 P=ATN((SIN(F1)/COS(F1))*COS(F2))
SOJ 590 P1=(P*180)/PI+AN
IIJ 600 IF F>=90 AND F<=270 THEN P1=P1+180
HFJ 610 IF P1<0 THEN P1=P1+360
LEJ 620 P=(P1*PI)/180
JLJ 630 R2=R*COS(I)
VNJ 640 X=1975
DXJ 650 IF Y>=X THEN Z=1972
BRJ 660 IF Y<X THEN Z=1976
WLJ 670 IF Y>=X THEN S=0
UCJ 680 IF Y<X THEN S=1
GNJ 690 GOSUB 1720
IFJ 700 T=(360/365.25)*(N/1.00004)
PYJ 710 K=T
GLJ 720 GOSUB 1850
QAJ 730 T=K
LPJ 740 T1=(T*PI)/180
BAJ 750 C=0.01672
YTJ 760 J=T+(360/PI)*C*SIN(T1-0.051943)
GNJ 770 J=J+99.5343
FJJ 780 IF J>360 THEN J=J-360
BFJ 790 IF J<0 THEN J=J+360
FUJ 800 H=((J-102.51044)*PI)/180
FTJ 810 R1=(1-C*C)/(1+C*COS(H))
VAJ 820 U1=((P1-J)*PI)/180
VCJ 830 U2=((J-P1)*PI)/180
KBJ 840 IF R2<R1 THEN GOTO 900
RBJ 850 Q1=(R1*SIN(U1))
IQJ 860 Q1=Q1/(R2-(R1*COS(U1)))
GYJ 870 Q1=ATN(Q1)
UCJ 880 Q2=(Q1*180)/PI+P1
CDJ 890 GOTO 940
RBJ 900 Q3=(R2*SIN(U2))
IRJ 910 Q3=Q3/(R1-(R2*COS(U2)))
GYJ 920 Q3=ATN(Q3)
ALJ 930 Q2=(Q3*180)/PI+J+180
LWJ 940 IF Q2>360 THEN Q2=Q2-360
HSJ 950 IF Q2<0 THEN Q2=Q2+360
NQJ 960 Q4=(Q2*PI)/180
IIJ 970 Q5=(R2*(SIN(I)/COS(I))*SIN(Q4-P))
YIJ 980 Q5=Q5/(R1*SIN(U1))
HJJ 990 Q5=ATN(Q5)
KQJ 1000 E1=0.40893864
```

program continued on page 187

Applying The Atari
continued from page 186

To delete an item, first display the list and get the number of the item you want to remove. Then press R for the remove operation and enter the number of that item. The item will be deleted from the list.

If you want to load a previously saved file, press L. You might then want to add items to this list by pressing A for the Add Items option. Add each item and press RETURN on an empty line when done. The added entries will be alphabetized together with the old entries and you can display, print, or save the new list.

Next Month

We'll enter an entertaining graphics program that will make you go to pieces. A digitized picture and more reader mail are in store too.

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A diskette of the programs listed in this month's column is available from the author for $7.00, postpaid. Please make checks payable to "Jeff Brenner" and specify your disk drive model.

"Program Perfect" is a utility used to check for typing errors while entering programs from this column. Readers may send a SASE for a listing or $5.00 for a diskette of this program.

Address all correspondence to Jeff Brenner, "Applying The Atari 2/86", c/o *Computer Shopper*, P.O. Box F, Titusville, FL 32781-9990. ●

Halley's program
continued from page 186

```
ESJ 1010 L1=(SIN(Q5)*COS(E1))
FBJ 1020 L1=L1+(COS(Q5)*SIN(E1)*SIN(Q4))
NXJ 1030 M1=ATN(L1/SQR(-L1*L1+1))
PBJ 1040 Y2=(M1*180)/PI
BKJ 1050 B1=((SIN(Q4)/COS(Q4))*COS(E1))
EVJ 1060 B1=B1-(((SIN(Q5)/COS(Q5))*SIN(E1))/COS(Q4))
FRJ 1070 G=ATN(B1)
MKJ 1080 H1=(G*180)/PI
OMJ 1090 I1=INT(Q2/90)
NVJ 1100 J1=INT(H1/90)
NSJ 1110 IF I1-J1=4 OR I1-J1=1 THEN H1=H1+360
NTJ 1120 IF I1-J1=2 OR I1-J1=3 THEN H1=H1+180
QMJ 1130 IF I1-J1=-4 THEN H1=H1+360
QNJ 1140 IF I1-J1=-2 THEN H1=H1-180
BXJ 1150 N1=H1/15
QUJ 1160 W=INT((N1-INT(N1))*60+0.5)
FMJ 1170 IF W=60 THEN N1=N1+1
WKJ 1180 IF W=60 THEN W=0
IGJ 1190 K1=ABS(Y2)
SGJ 1200 W1=INT((K1-INT(K1))*60+0.5)
GQJ 1210 IF W1=60 THEN G1=G1+1
AZJ 1220 IF W1=60 THEN W1=0
IDJ 1230 G1=INT(K1)
XOJ 1240 IF Y2<0 AND G1<1 THEN W1=-W1
QHJ 1250 D1=R1*R1+R2*R2
JNJ 1260 D1=D1-(2*R1*R2*COS(U1))
IJJ 1270 D2=SQR(D1)
MZJ 1280 R3=D2/COS(I)
UBJ 1290 K9=R
ICJ 1300 GOSUB 1940
TUJ 1310 R=K9
CIJ 1320 K9=R3/10
IFJ 1330 GOSUB 1940
CFJ 1340 R3=K9*10
KJJ 1350 M0=4.1:N=3.1
OTJ 1360 IF D$<0 THEN M0=5:N=4.44
HLJ 1370 MA=M0+5*0.4343*LOG(R3)
OMJ 1380 MA=MA+N*2.5*0.4343*LOG(R)
XYJ 1390 MA=(INT(10*MA))/10
CWJ 1400 IF Y2<0 THEN G1=-G1
ENJ 1410 PRINT CHR$(125);:PRINT DA$(1,38):IF PRN THEN PRINT #1;DA$(1,38)
CCJ 1420 POKE 85,10:PRINT "DATA FOR ";CO$:PRINT
LFJ 1430 IF PRN THEN PRINT #1;SP$(1,8);"DATA FOR ";CO$:PRINT #1
MCJ 1440 PRINT "DATE: M/D/Y=";M;"/";D;"/";Y
WSJ 1450 IF PRN THEN PRINT #1;"DATE: M/D/Y=";M;"/";D;"/";Y
GZJ 1460 PRINT "DAYS TO PERIHELION.....";INT(DS)
OOJ 1470 IF PRN THEN PRINT #1;"DAYS TO PERIHELION.....";INT(DS):PRINT #1
YUJ 1480 PRINT
SKJ 1490 PRINT "COORDINATES: epoch 1950"
DRJ 1500 IF PRN THEN PRINT #1;"COORDINATES: epoch 1950"
DXJ 1510 PRINT "RA :";DT$(1,19);INT(N1);"HRS";SP$(1,2);W;"MIN"
ONJ 1520 IF PRN THEN PRINT #1;"RA :";DT$(1,19);INT(N1);"HRS";SP$(1,2);W;"MIN"
SHJ 1530 PRINT "DEC:";DT$(1,19);G1;"DEG";SP$(1,2);W1;"MIN"
DXJ 1540 IF PRN THEN PRINT #1;"DEC:";DT$(1,19);G1;"DEG";SP$(1,2);W1;"MIN"
CZJ 1550 PRINT :IF PRN THEN PRINT #1
QNJ 1560 PRINT "DISTANCES:":IF PRN THEN PRINT #1;"DISTANCES:"
PXJ 1570 PRINT "COMET TO SUN";DT$(1,11);R;SP$(1,3);"AU"
BNJ 1580 IF PRN THEN PRINT #1;"COMET TO SUN";DT$(1,11);R;SP$(1,3);"AU"
VGJ 1590 PRINT "COMET TO EARTH";DT$(1,9);R3;SP$(1,4);"AU"
GNJ 1600 IF PRN THEN PRINT #1;"COMET TO EARTH";DT$(1,9);R3;SP$(1,4);"AU"
CWJ 1610 PRINT :IF PRN THEN PRINT #1
PYJ 1620 PRINT "PREDICTED MAG";DT$(1,10);MA
BOJ 1630 IF PRN THEN PRINT #1;"PREDICTED MAG";DT$(1,10);MA
OUJ 1640 PRINT DA$(1,37):IF PRN THEN PRINT #1;DA$(1,37)
OBJ 1650 POKE 85,9:PRINT "PRESS 0 FOR ANOTHER DATE"
IUJ 1660 POKE 85,9:PRINT "PRESS P FOR PRINT OUT"
KJJ 1670 GET #2,DATE
UMJ 1680 IF DATE=ASC("0") THEN PRINT CHR$(125);:GOTO 1710
EAJ 1690 IF DATE=ASC("P") THEN PRN=1:CLOSE #1:OPEN #1,8,0,"P:":GOTO 1410
SEJ 1700 PRINT CHR$(253):GOTO 1670
DJJ 1710 GOTO 230
EUJ 1720 A=(Y-Z)/4
KRJ 1730 A1=INT(A+S)
UBJ 1740 N=365*(Y-X+S)+A1
XLJ 1750 IF INT(A)<>A THEN GOTO 1770
NEJ 1760 IF (M=2 AND D<29) OR M=1 THEN N=N-1
ITJ 1770 IF M>2 THEN GOTO 1810
XLJ 1780 M2=M-1
CGJ 1790 M2=31*M2
FMJ 1800 GOTO 1830
XDJ 1810 M2=M+1
XTJ 1820 M2=INT(30.6*M2)-63
OGJ 1830 N=N+M2+D-365*S
CZJ 1840 RETURN
ISJ 1850 IF K<0 THEN GOTO 1870
MQJ 1860 IF K>360 THEN GOTO 1900
AHJ 1870 K=K+360
LDJ 1880 IF K>=0 THEN GOTO 1930
FZJ 1890 GOTO 1870
ADJ 1900 K=K-360
OWJ 1910 IF K<=360 THEN GOTO 1930
FNJ 1920 GOTO 1900
CZJ 1930 RETURN
GCZ 1940 K9=INT(K9*1000+0.5)/1000:RETURN
```

HabaWriter
continued from page 71

Desk Menu

Figure 2 also shows the Desk menu. It's much like the standard Atari one with 'About..", VT52, Control panel, Set RS232, and Install printer.

File Menu

Figure 3 shows the File menu that contains New, Open, Close, several versions of Save to aid in interfacing with other systems. Preferences which are for tabs, inserting or replacing modes, showing markers and line counters, and finally the Quit which will inquire if you know you'll lose what you've just typed.

If you select Open you get Figure 4 which presents a list of all of the .DOC files you have stored and in this case, allows you to type in the one you are developing at this time.

Edit Menu

This one has, as you can see in Figure 5 selectable items such as Cut, Copy, Paste, Paste Document, Clear, Move to Cursor, Show Clipboard and Select All. When you want to Cut a section of text you must first holding down the left mouse button and dragging the cursor to define the cut area as shown in Figure 6 and then move to the edit menu and click on Cut. It is put into a Clipboard area which you can also view as another text window and change and even paste back at a new location or the original one. The Paste Document allows you to pull another document in from the disk and paste it at the location of the cursor. This has a lot of potential for mass production of letters such as typing one set of address files and then pasting each into a "one of a kind" letter.

Search Menu

Figure 7 presents the Search
continued on page 188

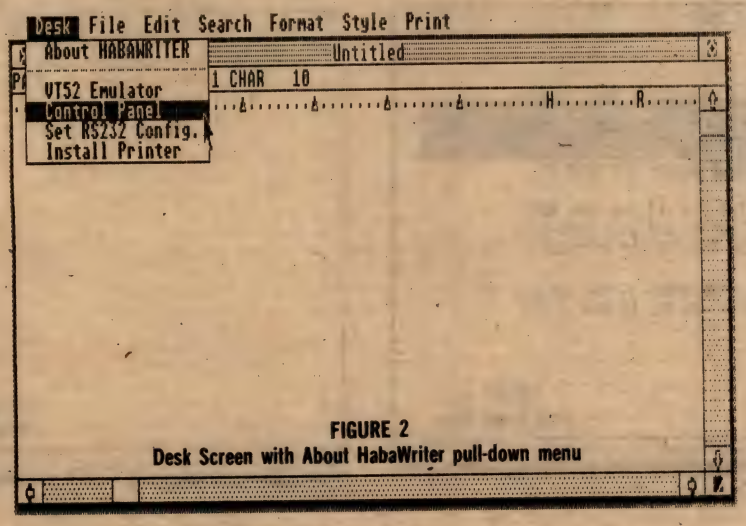


FIGURE 2
Desk Screen with About HabaWriter pull-down menu

DEALERS - RETAILERS - VARS

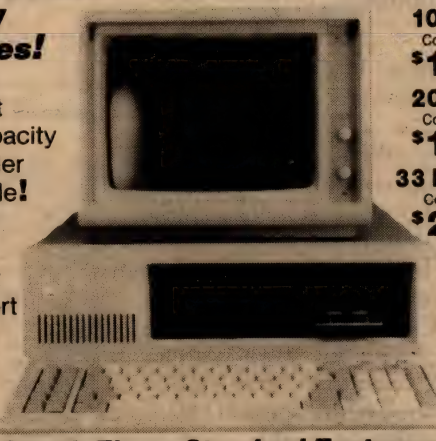
Quantity Discounts

FREE Catalog - 100's of items

CALL 714/898-0840 or write

$1254.00 WOW!

Complete System! XPC TURBO



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- RAM Disk
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- 640K Capacity
- PrintSpooler
- Turbo mode! 4.77MHz to 6.67MHz!
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10 Meg H.D. Complete System! $1749.00

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Software
XWORD ■ XBASIC ■ XBASE ■ XCALC ■ XCOM ■

Check These Standard Features:
• Full-Size, Feather-Touch, Capacitance Keyboard, 10 Function Keys, Calculator-Type Numeric Keypad • • Parallel & Serial I/O • Real Time Clock • Game Port • 2-Slimline 5¼" DS/DD 48 TPI 360K Drives • • 8 IBM expansion slots • RAM Disk • Print Spooler • 4 DMA & 3 Timer channels • • Full 640K capacity on-board • 8088 16-bit CPU • Monochrome Video Card • • Up to 32K of EPROM (full 8K supplied) • Supports PC-DOS - MS-DOS - CP/M-86 • • Power Supply Hard-Disk-Ready, no need to add-on additional power • • Hi-res 12" Monitor, Green/Amber Screen, 25MHz bandwidth •

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300/1200 Baud Hayes Compatible!

- Runs the popular Hayes communications software
- FCC apprvd direct RJ-11 connection
- Phone Cable & Power Supply one low price.

Finally a **price breakthrough** on a Hayes compatible, external 300/1200 baud modem. This low price is without driver software, but if you need it add $25.00. Call for a 26 page catalog of our special deals. Look in this spot every month for Hot, New items sure to catch your interest.

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We included every feature you would want in a modem card. It's FCC registered for direct connection to your modular phone jack with the cord included. There is a separate modular jack for your telephone so you can listen through the on-board speaker. The Auto-Dialer works on rotary lines, tone lines, or a combination of both, and will pause for use with Sprint or MCI.

MOD-8720-00 ..... $199.00

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- TEAC 55-B ½ht. DRI-6660-00 ..... $105.00
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Power Supplys 135 or 150 Watts*

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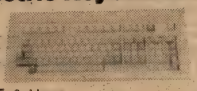

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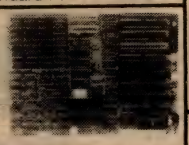

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7 PAK Multifunction

- Floppy Disk Cont.
- 1 Std, 1 opt Serial
- Parallel Port
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This was designed to accompany our world-famous ***TURBO*** **Motherboard**. Includes cables & manual.

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Telex: 887841 XORDATA HTBH
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HabaWriter Word

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menu which is fairly conventional. You can search and replace as desired and find most any text you want. You can jump up and down pages at a time or just jump to any page you wish. Naturally, there are windows for each selection to ask the appropriate questions and safe guards.

Format Menu

The Format menu shown in Figure 8, contains the set up for the document for margins, tabs, page breaks and pagination. There are also alignments left, right center and flush. You can then format a single paragraph or the whole document. The formatting is quite fast also.

One problem I have not been able to answer is wanting to double line a document automatically. When writing articles for magazines, you are requested to double line the printing for editing purposes. To do this, I had to go back and manually do the task. This seems to be a fundamental deficiency with the HabWriter. I hope to find something buried in the operation that will let me do this.

Style Menu

Figure 9 shows the Style menu which allows for Plain Text, Underlined text and Bold text. As it comes with Epson printer set up and I have an Epson, there was no difficulty with performing a document print or even using Atari's ALT-HELP screen dump capability. One item that is noted is that when using a color monitor, the underline operation does not show up on the screen but does on the printer.

The other problem that I detected is that normally you can switch back and forth betweem bold and plain text just by selecting the style and then reformatting the document. For the case where I inadvertently got into the Underline mode and typed several pages in that mode. I was unable to eliminate it from my printing. I finally just junked the first effort and started over. I have been afraid to experiment with the underline mode since. I would suggest you be cautious in this area. Even after this, I got back into it and not by selecting it. It might be due to doing screen dumps or something not normal to word processing. I'll keep digging because Haba puts out good software and I must be doing something abnormal.

Print Menu

Finally comes the Print menu. Figure 10 presents the four items which are Print Document, if selected Print Block, Print Options which are the number of lines per page and such and then the Printer file which now contains a file for the Epson. I haven't tried to investigate how you set it up for other printers as mine is an Epson and I'm not too interested.

Shortcuts

After you've used the menus for a while, you find it takes a little longer than you'd like to flip back and forth to the menus so Haba has provided an excellent interface with the FUNCTION key to do the menu jobs. After you press the HELP key you can see Figure 11 which presents the matrix of Function keys in combination with Shift, Control and Alternate keys to perform all of the menu functions. I suggest you pull in the shortcut with the Help key and get a screen dump with the Alt-Help keys and tape the dump near your keyboard. As I get used to the Function matric, I find I can move through a document

continued on page 189

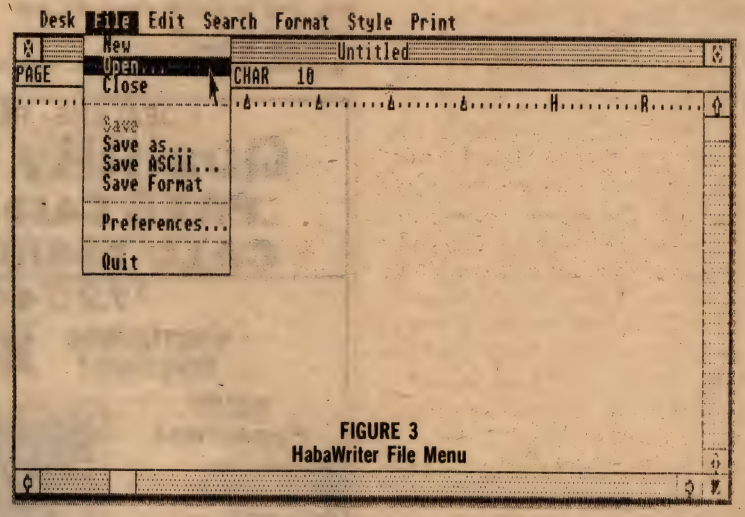

FIGURE 3
HabaWriter File Menu

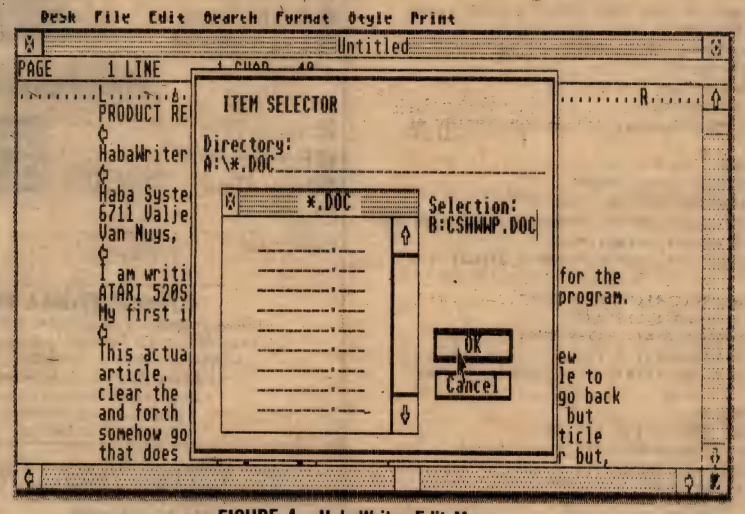

FIGURE 4 HabaWriter Edit Menu

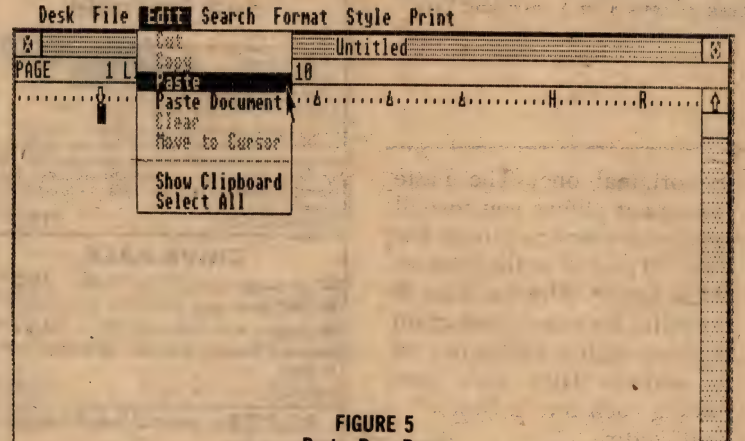

FIGURE 5
Paste, Drop-Down

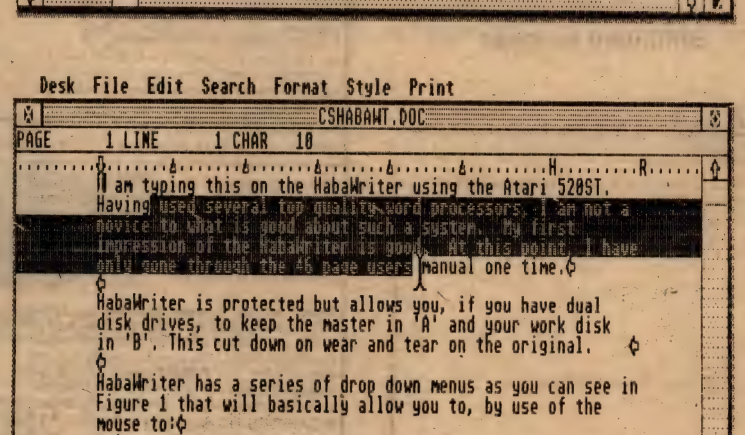
Desk File Edit Search Format Style Print
CSHABAWT.DOC
PAGE 1 LINE 1 CHAR 10
I am typing this on the HabaWriter using the Atari 520ST.
Having used several top quality word processors, I am not a
novice to what is good about such a system. My first
impression of the HabaWriter is good. At this point, I have
only gone through the 46 page users manual one time.
HabaWriter is protected but allows you, if you have dual
disk drives, to keep the master in 'A' and your work disk
in 'B'. This cut down on wear and tear on the original.
HabaWriter has a series of drop down menus as you can see in
Figure 1 that will basically allow you to, by use of the
mouse to:
&Control Files
&Edit
&Search
&Format

FIGURE 6
Drop Down Menu

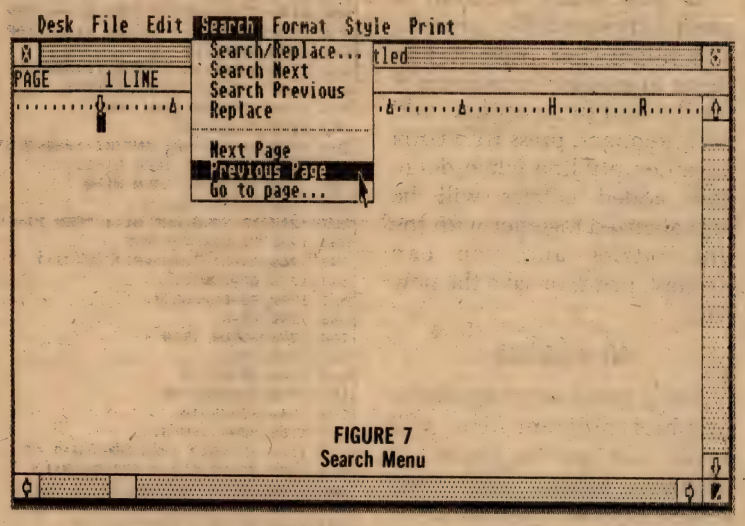

FIGURE 7
Search Menu

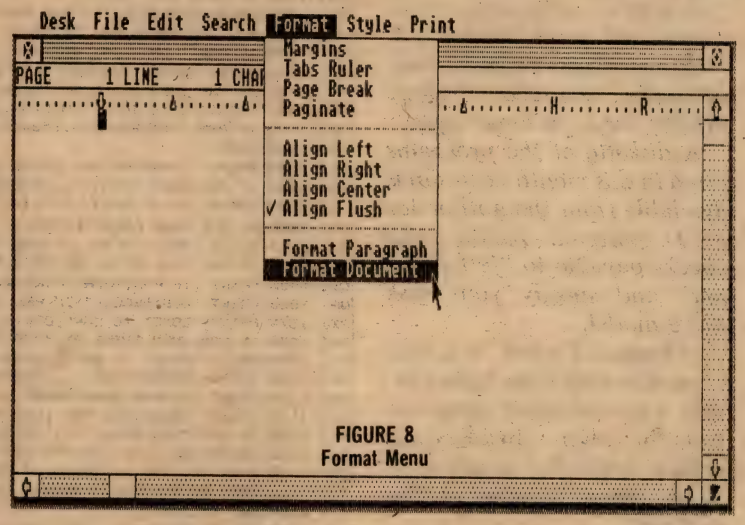

FIGURE 8
Format Menu

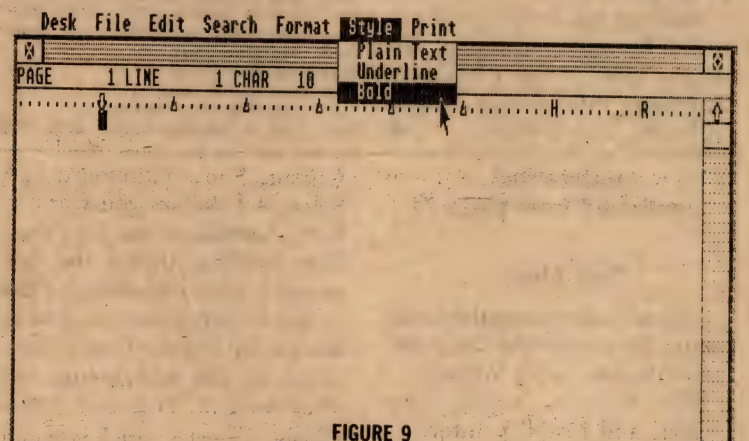

FIGURE 9
Print Style Menu

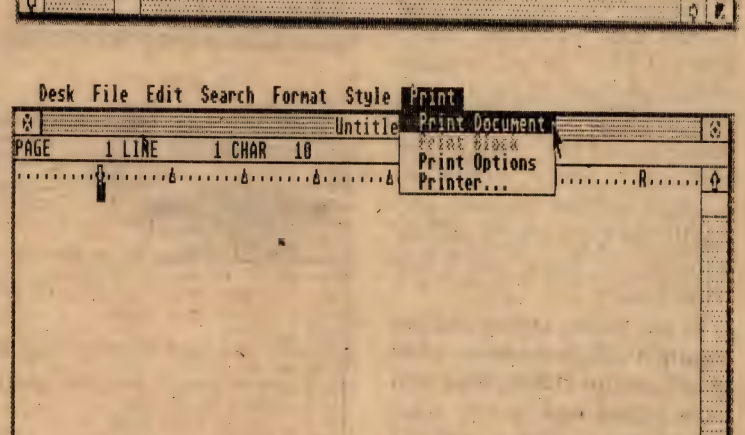

FIGURE 10
Print Menu

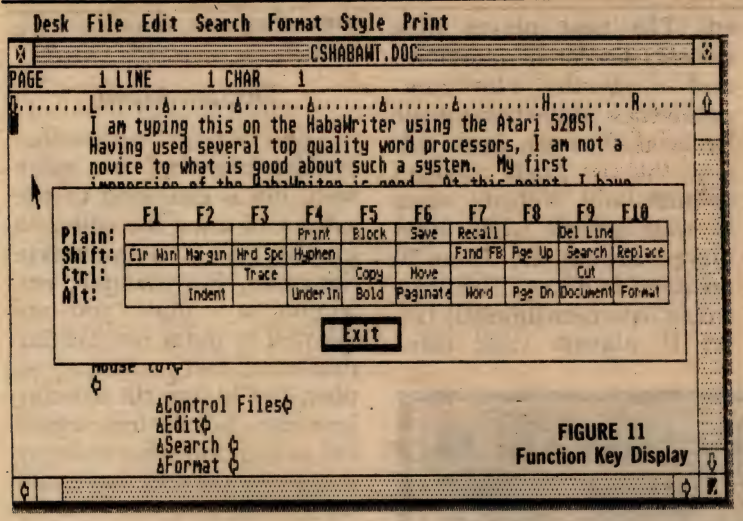
Desk File Edit Search Format Style Print
CSHABAWT.DOC
PAGE 1 LINE 1 CHAR 1
I am typing this on the HabaWriter using the Atari 520ST.
Having used several top quality word processors, I am not a
novice to what is good about such a system. My first
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10
Plain: Print Block Save Recall Del Line
Shift: Clr Win Margin Hrd Spc Hyphen Find FB Pge Up Search Replace
Ctrl: Trace Copy Move Cut
Alt: Indent Underln Bold Paginate Word Pge Dn Document Format
Exit
Control Files
Edit
Search
Format

FIGURE 11
Function Key Display

HabaWriter Word
continued from page 188

about as fast as I can think and type.

One of the nice features is being able to jump to the top, bottom, left and right of a line or the full page. This is done by the CLR HOME and arrow keys. Press Clr-Home ONCE followed by any arrow and you move in that direction, i.e., to beginning or end of line or up or down one screen page of 18 lines. Pressing Clr-Home Twice then the arrow, you jump to the top or bottom of the document or to the full "edge of the paper" I got a lot of use out of this feature.

Another nice little feature is that you can move the cursor with the "I" mouse just by locating it and doing a one-click.

Conclusion

Overall, I like the HabaWriter Word Processor. It has all of the features I need except for the lack of double line draft presentation. If I conquer the underline problem I'll have a very respectable word processor. At a list price of $74.95, it is quite nice. When the Speller becomes available and shows compatability and usability, I expect I'll make the HabaWriter my basic word processor.

For further information contact: Haba Systems, Inc., 6711 Valjean Avenue, Van Nuys, CA 91406. ●

Robot Intelligence
continued from page 69

change in its movement pattern. Once the way is clear, it will start moving again and continue moving in the same direction until it runs into another barrier.

The first book, *"Robot intelligence,"* was written when the TRS 80 computer was highly popular and the programs are written in Basic with that machine in mind. The second book, *"Projects In Machine Intelligence,"* is the sequel to the first book. This book has programs in TRS-80 and Applesoft Basic and the Applesoft Basic programs can be used with some modifications by Commodore and Atari owners. I would suggest that for best results the Atari owner use Basic XL or Microsoft Basic for the programs.

I bought the book *"Projects in Machine Intelligence For Your Home Computer"* first because of the Applesoft program examples it had, but the first book, *"Robot Intelligence,"* has more about the theory of artificial intelligence and how to implement testing procedures to measure the creatures' response to its environment.

After you are able to create a simple Alpha creature you can then use the same subroutines in larger and more complex programs to increase the scope of the study. This modular concept allows you to load in a previously created program and then modify that program to a higher level. You will be creating a number of different creatures and environments which will include:

1. A fundamental Alpha creature which reacts to its environment but does not learn from experience.
2. A killer Alpha creature which may attack and destroy any other creature it meets.
3. A simple Alpha creature community.
4. A killer Alpha creature in a community of non-killers.
5. A killer Alpha duel.
6. A Beta creature which learns from its experiences.
7. A killer Beta creature.
8. A mixed community of Alpha and Beta creatures.

In addition to all those different combinations, Dave Heiserman has shown how to give the creatures special environments such as mazes and how to collect data on their responses.

I have to say that I have read a number of Dave Heiserman's books including, *"Radio Astronomy for Amateurs,"* and *"Experiments In Four Dimensions,"* and have found that his books have lead me down paths which are always running over interesting and new territory. After I had the chance to study the subject of artificial intelligence using Dave Heiserman's programs on my Atari computer, I also changed my perception of low level animal intelligence. For example, when I see a sow bug crossing my back yard I don't feel it thinks, "What a nice day! I think I'll walk on over to the flower garden today.", but really thinks more like, "Walk, walk, walk," (BUMP) "What the hell is that?? Turn, turn, walk, walk," (BUMP) "What the hell is that? Turn, walk,", etc. I have included a short Alpha creature program in Atari Basic to demonstrate the basic concept and to assist you in converting the programs in the book from Applesoft to Atari Basic. I would suggest that for the most enjoyment of this new field of study you should purchase both books. For a total of $22.00 you will gain insight into a new and exciting subject and receive more pure creative enjoyment than you will get from any $25 or $40 game. Perhaps some day you will even write a paper on teaching Beta creatures how to build their own two dimensional houses! ●

```
10 REM FUNDAMENTAL ALPHA DEMO
15 REM DOS TITLE "ALPHA1"
20 CLR
25 REM FROM PROJECTS IN MACHINE INTELLIGENCE FOR YOUR HOME COMPUTER
28 REM BY DAVID HEISERMAN
30 GOSUB 1000
110 REM ** INITIALIZE ALPHA POSITION**
120 LET PX=12+INT(5*RND(1))-2:PY=12+INT(5*RND(1))-2
124 REM ** ALPHA MOTION CODE **
125 CI=INT(5*RND(1))-2:CJ=INT(5*RND(1))-2:IF CI=0 AND CJ=0 THEN 125
130 GOSUB 2000
135 POKE 752,1
140 POSITION PX,PY:PRINT " "
145 PX=NX:PY=NY
150 POSITION PX,PY:PRINT "■"
154 POKE 752,1
155 GOTO 130
160 REM
165 REM
1000 REM ** CREATE THE BORDER**
1005 GRAPHICS 0
1010 PRINT "                                        "
1020 PRINT "┌──────────────────────────────────────┐"
1021 LET X=X+1
1025 IF X>=15 THEN GOTO 1050
1026 REM
1030 GOTO 1020
1050 PRINT "└──────────────────────────────────────┘"
1053 POKE 752,1
1055 POSITION 10,17:PRINT "BASIC ALPHA DEMO"
1056 POSITION 2,18:PRINT "FROM'PROJECTS IN MACHINE INTELLIGENCE"
1057 POSITION 2,19:PRINT "FOR YOUR HOME COMPUTER'"
1058 POSITION 2,21:PRINT "BY DAVID HEISERMAN"
1060 RETURN
2000 REM ** SEARCH AHEAD ROUTINE**
2005 NX=PX:NY=PY:CX=32:CY=32
2010 SI=SGN(CI):SJ=SGN(CJ):AI=ABS(CI):AJ=ABS(CJ)
2015 IF AI=0 THEN 2040
2020 AI=AI-1
2025 IF SI>0 THEN NX=NX+1:GOTO 2035
2030 NX=NX-1
2033 REM ** LOCATE REPLACES APPLE SCRN X,Y FUNCTION**
2035 LOCATE NX,NY,CX
2040 IF AJ=0 THEN 2065
2045 AJ=AJ-1
2050 IF SJ>0 THEN LET NY=NY+1:GOTO 2060
2055 NY=NY-1
2058 REM ** LOCATE REPLACES APPLE SCRN X,Y FUNCTION**
2060 LOCATE NX,NY,CY
2065 IF  NOT (CX=32 AND CY=32) THEN 125
2070 IF AI=0 AND AJ=0 THEN RETURN
2075 GOTO 2015
2080 REM
2085 REM
```


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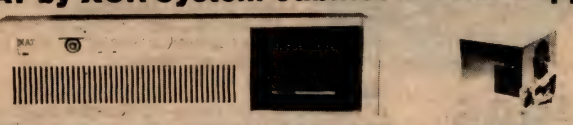

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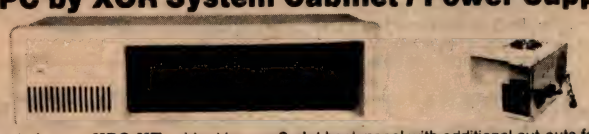

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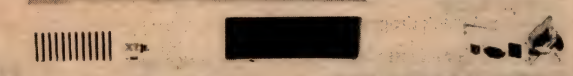
XTjr. by XOR System Cabinet



The **XTjr.** cabinet is only 3" x 16.5" x 15" yet it will hold a standard XT compatible motherboard. A special extender card BOA-5068-00 is used in the 5th slot to allow up to four add-on boards mounted horizontally in the cabinet. Two additional cut-outs are supplied for serial I/O. The cabinet price includes a switching power supply. Front panel cut-out for a half-height floppy or hard disk. AC switch and AC outlet for monitor on the rear panel.
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Trivia Mania
continued from page 185

3) Eating
4) Hammer throw

Q. Most popular hobby in America:

1) Photography
2) Stamp Collecting
3) Coin Collecting
4) Drinking

(Answers to above are #1 and #2 respectively, for those just dying to know.)

Playing The Game

Trivia Mania can be played by one to four players, but I doubt many will be using the one-player option. A trivia game is definitely a social type of entertainment; the more players that particate, the more exciting the game. Unfortunately, *Trivia Mania* falls with the two, three and four player options as well. Rather than taking turns answering questions, each player must answer a group of 25 (for a four-player game), 33 (for a three-player game) or 50 (for a two player game) questions--all in succession. That player then gets his score and is finished. The next player then answers his lot of questions, and so forth. The competitiveness of the trivia game has been effectively destroyed, and this is *Trivia Mania's* greatest fault. Nobody wants to wait around while other players answer 25, 33 or 50 questions in a row. The game would have been infinitely better if players took turns answering one question at a time.

Documentation

The 12-page instruction booklet describes the game well, but is confusing on the subject of using the editor to create your own trivia databases. For example, one section says that "you are allowed to index our existing databases" and proceeds to explain how to start the indexing procedure Yet the instructions fail to mention what indexing does for you or why you would want to do it.

Conclusions

While *Trivia Mania* offers the unique feature of adding your own trivia data, the method of game-play is dull. The excitement of a multi-player Trivial Pursuit game just isn't here. XLENT Software can still use those 1800 trivia questions--perhaps with an improved program that would allow real multi-player participation.

Requires:
Atari 800/800XL/130XE
Program Author:
Jan Iverson

Price:
$29.95

Warranty:
90 days, free replacement

Manufacturer:
XLENT Software
P.O. Box 5228
Springfield, VA 22150
(703) 644-8881

Ratings For Trivia Mania

*Poor, **Fair
***Good, ****Excellent

Design	*
Practicality	**
Documentation	**
Value For Price	**
Average	**

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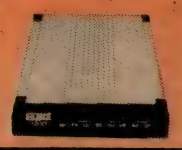

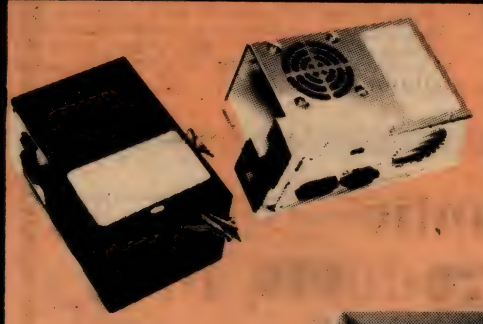

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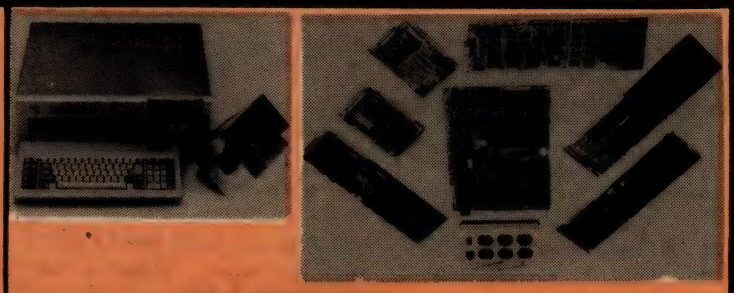

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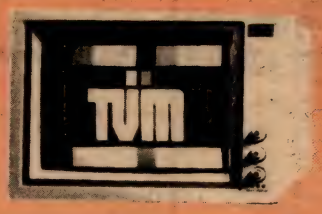

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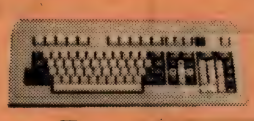

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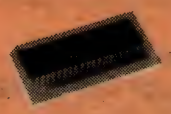

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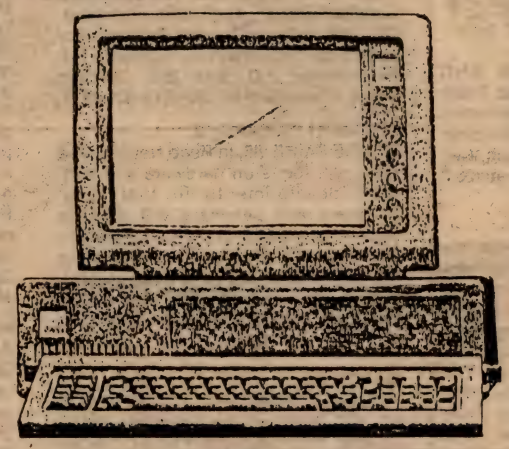

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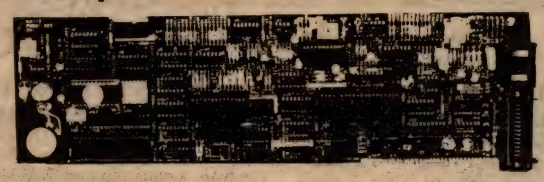

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Coming Events

If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.

1986
JANUARY

JANUARY 9-12

CES-WINTER, Las Vegas, NV, Convention Center. Call the Consumer Electronics Show at (312) 861-1040.

JANUARY 11
6TH PHILADELPHIA MICRO SHOW AND FLEAMARKET, at the George Washington Conference Center, Willow Grove, PA. Over 175 vendors; 10 a.m. to 5 p.m.; $5 adults, $3 children 5-12; vendor spaces $25-$70 each. Call Ken Gordon Productions Inc. at (201) 297-2526 or (800) 631-0062.

JANUARY 19
2ND EXPO/64 COMPUTER FLEAMARKET, at Meadowlands Hilton Hotel, Secaucus, NJ. Exclusively for owners of Commodore 64/128/20 (& Amiga) computer systems. Over 150 vendors; 10 a.m. to 5 p.m.; $7 adults, $4 children 5-12. Call Ken Gordon Productions Inc. at (201) 297-2526 or (800) 631-0062.

JANUARY 19-22
FORUM '86 (Winter Session), at Dallas Marriott Hotel Quorum Center, Dallas Texas. The theme of this show is "Innovative Recognology Systems Improve Productivity." There will be a special education series of five sessions covering Optical Disk, Voice Recognition, Image Processing, MICR and Forms. For additional information conact Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vermont 05255; (802) 362-4151.

JANUARY 25
6th BOSTON MICRO SHOW AND FLEAMARKET, at the Northeast Trade Center, Woburn, MA. Over 200 vendors; 10 a.m. to 5 p.m.; $5 adults, $3 children 5-12; vendor spaces $25-$70 each. Call Ken Gordon Productions Inc. at (201) 297-2526 or (800) 631-0062.

JANUARY 25
BAY AREA COMPUTER SWAP, at the Cow Palace in San Francisco, California. The Bay Area Computer Swap brings the buying public in contact with a wide variety of top quality personal computer products, all of which are available for immediate purchase at the show. The show will be open to the public from 10:00am to 5:00pm. Admission is $5.00. For additional information call (415) 340-91134

JANUARY 26
THE MULTI-VENDOR PERSONAL COMPUTER SHOW, at Holiday Inn, 860 Irving Park Road, Itasca, Illinois. New and used hardware, software, peripherals, supplies, parts, etc. Show open from 9:30am to 4:00pm. For additional information call (312) 940-7547

FEBRUARY

FEBRUARY 11-13
AUDITING PROCEDURES FOR NCR FINANCIAL APPLICATIONS, in Chicago, teaches and reviews effective audit techniques used on all computer systems. Handbook of Guidelines and Audit Work Programs for your business, General Controls, Applications Controls, G/L, A/P, A/R, and Payroll Reviews. For additional information, contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, Illinois 60415-0255; (312) 839-2611.

FEBRUARY 28-MARCH 2
STRIDE FAIRE '86, in Reno Nevada, The Faire will focus on hardware and software developments in that area. Speakers and seminars will address topics form 68020 chip development to the newest language and operating systems available. For additional information contact Stride, P.O. Box 30016, Reno, NV 89520-0016; (702) 322-6868.

MARCH

MARCH 3-6
FIRST INTERNATIONAL CONFERENCE ON CD ROM, at the Sheraton Hotel, Seattle, WA., discussing how CD ROM will affect traditional print-based publishing, business productivity software, business computer systems, and home and entertainment systems. Will incorporate invited presentations from leading and influential authorities and experts, key equipment suppliers, publishers, and experienced users. Cost for attending is $799 until February 1; the cost will then be $899. All papers should be submitted by January 6 to Min S. Yee, Conference Chairman, Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA 98009.

MARCH 3-6, 1986
SECOND ANNUAL COMDEX IN JAPAN will be held in Tokyo. The Asian edition of the world's largest computer industry trade show will be held at the Harumi Exhibition Center. More than 200 leading companies from Japan, other Asian countries and the U.S. are expected to display and demonstrate new computer systems, peripherals, software, media, supplies, services, accessories and other related items. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts, 02194, (617)449-6600.

MARCH 11-13, 1986
12th ANNUAL FEDERAL DP AND COMMUNICATIONS is to be held in Washington at the DC Convention Center. Geared to the special requirements of Federal data processing professionals. More than 200 leading manufacturers and suppliers are expected to display and demonstrate computer systems, data communications and communications equipment, office automation systems, software, timesharing, network services and related equipment. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts 02194, (617)449-6600

MARCH 11-13
AUDITING ON-LINE HEALTHCARE ORDER ENTRY AND UB-82, in Chicago, teaches and reviews effective audit techniques used in all Healthcare Computer Systems. Handbook of Guidelines and techniques to audit on-line ordery entry and determine compliance with UB-82. For additional information contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, Illinois 60415-0255; (312) 839-2611

MARCH 19-21
PERSONAL COMPUTER INTERFACING WORKSHOP for Scientific Instrument Automation, from Virginia Tech; held in Blacksburg, Va.; directed by Mr. David E. Larsen and Dr. Paul E. Field. $495. 3 days. Hands-on workshops with each participant wiring and testing interfaces on the IBM-PC and other personal computers. Call or write Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, VA 24061, (703) 961-4848.

MARCH 23-26, 1986
THE FIFTEENTH INTERNATIONAL TI-MIX CONFERENCE AND TRADE SHOW, "Achieving Your Potential" will be held at the Lowes Anatole Hotel in Dallas, Texas. It focuses on the powerful vehicle that TI-MIX provides for users: how to take full advantage of Texas Instruments computers and peripherals. For further information contact TI-MIX, M/S 2200 CC052, PO Box 2909, Austin, Texas 78769

MARCH 24-27, 1986
14th ANNUAL INTERFACE '86 Conference and Exposition will be held at the Georgia World Congress Center in Atlanta, GA. More than 300 companies are expected to display and demonstrate computer systems and communications services for large-scale corporate, government and institutional users. For further information contact The Interface Group, 300 First Avenue, Needham, Massachusetts 02194

APRIL

APRIL 1-3, 1986
THIRD ANNUAL COMDEX/WINTER
The winter edition of the world's largest computer industry trade show, will be held at the Los Angeles Convention Center. More than 200 leading companies are expected to display and demonstrate new computer systems, peripherals, software, media and supplies, services, accessories and other related items. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts 02194, (617)449-6600

April 7-10, 1986
ANNUAL CONVENTION AND TECHNOLOGY EXPOSITION, at Diplomat Hotel, Hollywood, Florida. This convention will feature four days of technical sessions of importance to design/drafting management. For additional information contact American Institute for Design and Drafting, 966 Hungerford Drive, Suite 10-B, Rockville, MD 20850; (301) 294-8712.

APRIL 12 & 13
FORT WORTH COMPUTER SHOW, at Amaon G. Carter Exhibit Hall Crestline Road, between Montogomery & University Drive, 250 8" tables. For additional information contact Bob Norman, P.O. Box 9504, Ft. Worth, TX 76107

APRIL 15-17
ROBBERY WITHOUT A GUN--DETECTION, PREVENTION, PROTECTION, in Chicago, teaches and reviews effective audit techniques used in the detection, prevention and protection of internal and external data security. You will be equipped with a *Handbook of Guidelines*, techniques and procedures to combat against "Robbery Without A ¼Gun." For additional information contact T.J. Enterprises, P.O. Box 255, Chicago Ridge, IL 60415-0255; (312) 839-2611.

APRIL 28 - MAY 1, 1986
SIXTH ANNUAL COMDEX/SPRING will be held at the Georgia World Congress Center, Atlanta Apparel Mart and Atlanta Merchandise Mart in Atlanta, GA. The springtime edition of the world's largest computer industry trade show. More than 700 leading computer and related companies are expected to display and demonstrate new computer systems, peripherals, software, media, supplies, services, accessories and other related items. For further information contact The Interface Group, Inc., 300 First Avenue, Needham, Massachusetts 02194, (617)449-6600.

MAY

MAY 6-8, 1986
GULF COMPUTER & BUSINESS SHOW, at Rivergate Convention Center, 4 Canal Street, New Orleans, Lousiana. For additional information contact Gulf Computer & Business Show, P.O. Box 640880, Kenner, Louisiana 70064; (504) 467-9949.

MAY 11-14, 1986
ASSOCIATION FOR SYSTEMS MANAGEMENT ANNUAL CONFERENCE, Hyatt Regency, New Orleans, Louisiana. For additional information contact ASM, 24587 Bagley Road, Cleveland, Ohio 44138; (216) 243-6900.

May 29-31, 1986
PERSONAL COMPUTER INTERFACING WORKSHOP for Scientific Instrument Automation, from Virginia Tech; held in Blacksburg, Va.; directed by Mr. David E. Larsen and Dr. Paul E. Field. $495. 3 days. Hand-on workshops with each participant wiring and testing interfaces on the IBM-PC and other personal computers. Call or write Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, VA 24061, (703) 961-4848.

SEPTEMBER

SEPTEMBER 18-19, 1986
COMDA/CANDAX, at Palais des Congres Montreal Convention Centre, Montreal, Canada. For additional information contact Candex Conferences Inc. 47 Lakeshore Road East, Mississauga, Ontario L5G 4L7; (416) 271-1601.

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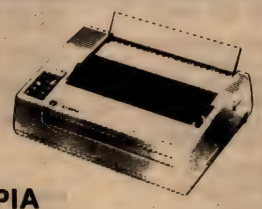

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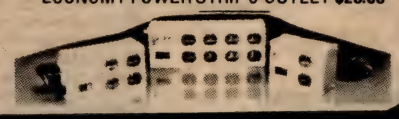

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The Bulletin Board is a regular feature of *Computer Shopper*. This is where you can list your public access of community bulletin board at no charge. If you would like to have your name, BBS and phone number listed send it to us. BBS listings are in area code sequence.

Listings are good for three months. After that period they will be purged unless we receive a Post Card or Letter saying the board is active. In addition, any reader who contacts a board can confirm that it is active, but it is up to the SYSOP to keep us current.

Thank you.

Send listings to:
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Functions

abs	conbuf	feof	getcseg	isascii	movmem	replace	strcat
asm	conc	ferror	getdseg	iscntrl	open	repmem	strcmp
asmx	cos	fflush	getd	isdigit	outp	rewind	strcpy
atan	cpystr	fgets	putd	islower	peek	right$	strlen
atof	creat	fileno	getdate	isprint	perror	rindex	strncat
atoi	cursblk	filetrap	gettime	ispunct	poke	rmdir	strncmp
atol	curslin	find	geti	isspace	poscurs	scanf	strncpy
bdos	curscol	floor	puti	isupper	pow	setbuf	strsave
bdosx	cursrow	fopen	getkey	itoa	printf	setbufsiz	system
bios	cursoff	fprintf	getmode	keypress	putc	setcolor	tolower
biosx	curson	fputs	setmode	left$	putchar	setdate	toupper
calloc	delete	fread	gets	len	puts	settime	ungetc
ceil	drand	free	getw	log	putw	setjmp	ungetch
cfree	exec	freopen	heapsiz	log10	rand	setmem	unllnk
chain	execl	fscanf	heaptrap	longjmp	read	sin	write
character	execv	fseek	hypot	lseek	readattr	sound	writechs
chdir	exit	ftell	index	malloc	reach	sprintf	xmembeg
chmod	exitmsg	fwrite	inp	alloc	writech	sqrt	xmemend
clearerr	exp	getc	insert	mathtrap	readdot	srand	xmemget
close	fabs	getch	iofilter	mid$	writedot	sscanf	xmemput
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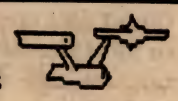

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Vadic Maxwell 1200PC (AD,AA,IS)	366
MultiTech MT-212-PC (AD,AA,IS,SP)	372

OTHER 300/1200 BAUD INTERNALS

Prometheus 1200A (APPLE II) (AD,AA,SP,IS)	359
Ven-Tel (HP 150) (AD,AA,SP)	345

300 BAUD STAND ALONE

Hayes Smartmodem 300 (AD,AA,SP,LD)	199
U.S. Robotics Password 300 (AD,AA,SP,IC)	169
Volksmodem (RC)	59
Vadic Maxwell 300V (AD,AA)	222

300 BAUD INTERNAL

Hayes Micromodem IIe (Apple II) (AD,AA,SP,IS)	225
Vadic Maxwell 300PC (IBM) (AD,AA,IS)	ZZZ

Feature Codes:

AD—Auto Dial
AA—Auto Answer
SP—Built-in Speaker
IC—Includes cable
IS—Includes Software
IP—Includes serial port
LD—LED Indicator lights
RC—Requires special cable
OA—Options available

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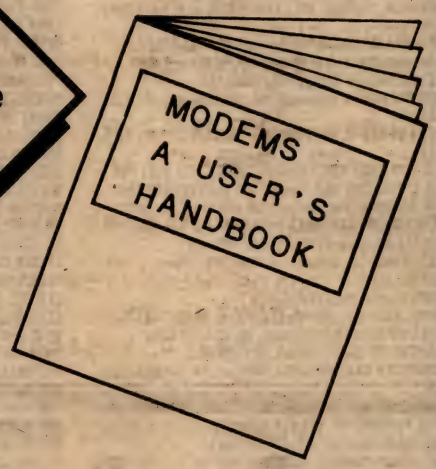

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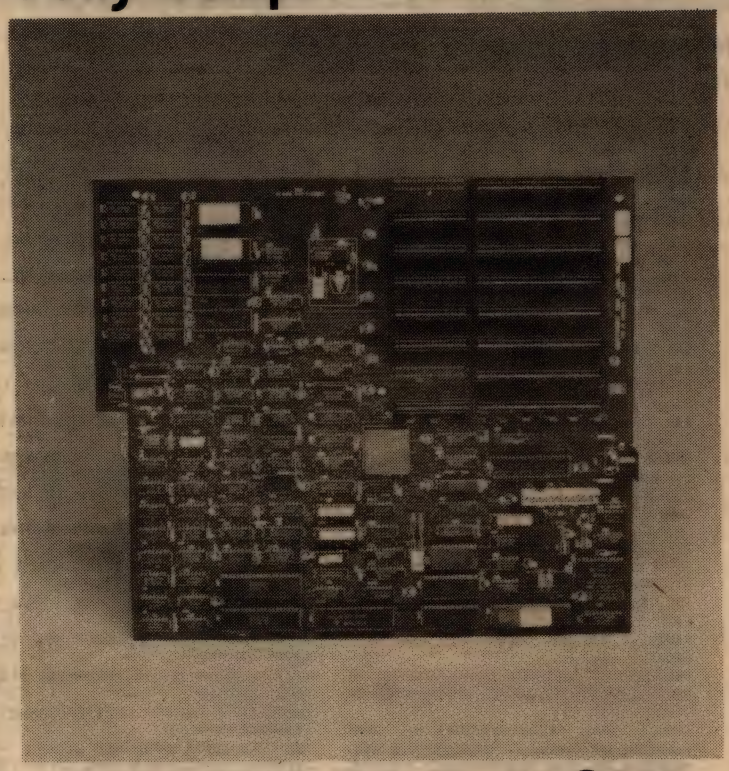

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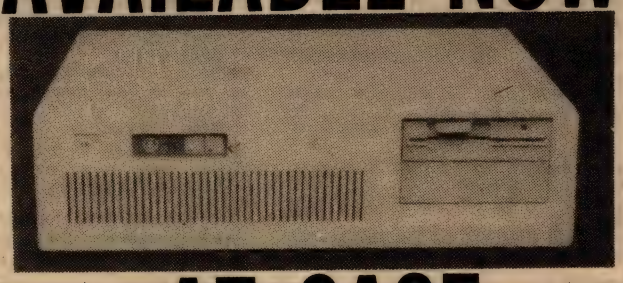

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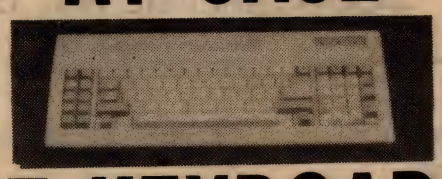

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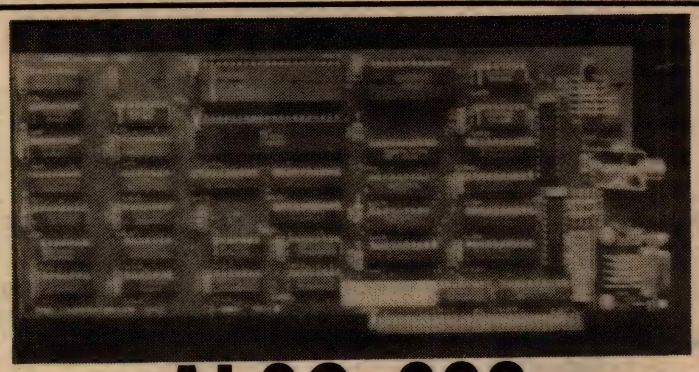

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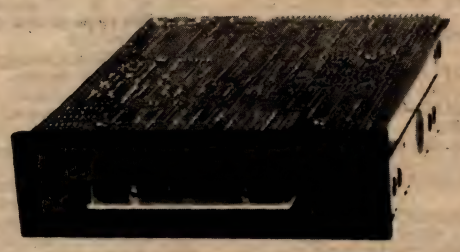

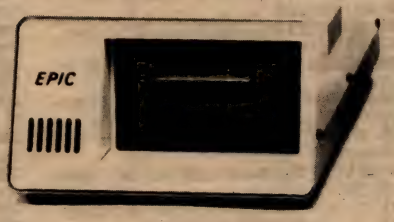

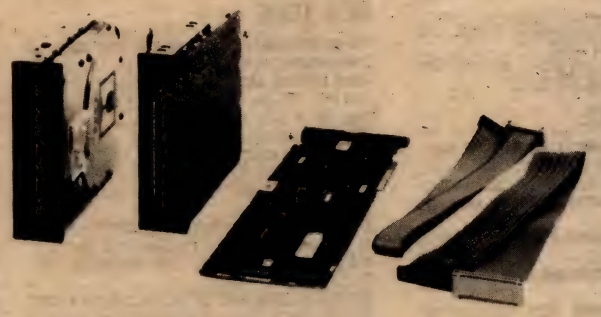

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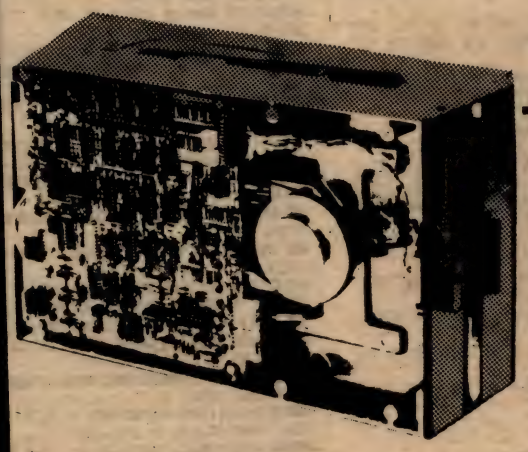

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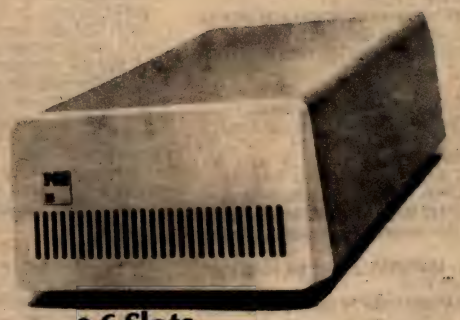

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NEW COMMODORE 64,64, BOX 281, POMPTON PLAINS, NJ 07444
NEW JERSEY LOTUS USERS' GROUP, C/O NOVA, 411 POMPTON AVENUE, CEDAR GROVE, NJ 07009
NEW JERSEY USERS GROUP, RD-1, 40 WOODLAWN TERRACE, LK. HOPATCONG, NJ 07849
NEW YORK METRO LUBE GROUP, 1 MARK RD, KENILWORTH, NJ 07033
9900 USERS GROUP, PO BOX K, MOORESTOWN, NJ 08057
NORTH JERSEY TRS-80 USERS GROUP, C/O DR. HOWARD SILVER, FAIRLEIGH DICKINSON UNIVERSITY, TEANECK, NJ 07666
NORTH JERSEY COMPUTER USERS GROUP, PO BOX 382, SPARTA, NJ 07871
NORTHERN NEW JERSEY 99er, PO BOX 515, Bedminister, NJ 07921
NORTHERN NJ COMPUTER CLUB, C/O HERMAN SACHS, 6 BRYSON RD., FAIRLAWN, NJ 07410
PRINCETON APPLE USERS GROUP (P.A.U.G.), P.O. BOX 413, ROCKY HILL, NJ 08553 609-921-0043
THE APPLE COMPUTER CLUB, C/O R.L. BARNES, RM 6D-214, BELL LABS, MURRAY HILL, NJ 07974
THE CENTRAL JERSEY 99 COMPUTER CLUB, PO BOX 673, BRICK, NJ 08723, C/O THEODORE E. MOZER, III
THE COMPUTER/INVESTOR USERS GROUP, 36 HIGHLAND AVENUE, METUCHEN, NJ 08840
TI DELEWARE VALLEY USERS GROUP, P.O. BOX 6240, STANTON BRANCH, WILMINGTON, DE 19804 ATTENTION: NEW JERSEY CHAPTER
TI USERS, NEWJUG, 981 TOWNLEY AVE., UNION, NJ 07083
TRS-80 USERS GROUP OF CHERRY HILL, PO BOX 61, NEW LISBON, NJ 08064
TRS-80 USERS GROUP OF CHERRY HILL, BRYAN PcPHEE — PRESIDENT, 418 VIRGINIA DR., BROWNS MILLS, NJ 08015
TRS-80 USERS GROUP OF MONMOUTH COUNTY, 80 BINGHAM AVENUE, RUMSON, NJ 07760

NEW MEXICO

APPLEQUERQUE COMPUTER CLUB, 1213 CALIFORNIA NE, ALBUQUERQUE, NM 87110
BORDER USER GROUP - SANYO (BUGS) 1967 DEFIANCE AVE., LAS CRUCES, NM 88001
BUGS NORTH - BORDER USER GROUP, Sanyo - ALBUQUERQUE, NEW MEXICO CHAPTER, (505)831-5029
BUGS SOUTH - BORDER USER GROUP, SANYO LAS CRUCES, NEW MEXICO CHAPTER, BO BARRY, PRESIDENT (505)523-2063
FIRST ATTACHE/2001 USER GROUP FAUG, C/O CHARLES RAISCH, PO BOX 2315, CORRALES, NM 87048-2315
ROCKS GROUP, GALLUP AEROSTAT SOCIETY, 1203 KIVA, GALLUP, NM 87301
THE SANTA FE COMPUTER CLUB, PO BOX 2261, SANTA FE, NM 87504

NEW YORK

ACE OF SYRACUSE, c/o KIM WALKER, 8290 SWALLOW PATH, LIVERPOOL, NY 13090
ADAM SUPPORT NETWORK EUROPE, c/o RICH & MARY COLLEPS, BOX 226, USAFSA, APO NEW YORK 09458
AMA, 135 W. 50TH ST., NY, NY 10020
ANSI, 1430 BROADWAY, NY, NY 10018
APPLE BYTERS CORPS, C/O HANK KOLK, 171 TREEHAVEN RD., BUFFALO, NY 14215
APPLE-CP/M-IBM UG, 737 EMPIRE AVENUE, FAR ROCKAWAY, N.Y. 11691
BASIS 108 USERS, C/O PERSONAL COMPUTER SERVICE, 52 JACKSON DRIVE SOUTH, POUGHKEEPSIE, NY 12603
BITS, BYTES, & PIECES UG, 1103 ARROWBEND DR., WILLIAMSON, NY 14589
BROOKLYN COMMODORE 64 UG, C/O MALCOLM GOTTESMAN, 1735 E. 13TH STR., BROOKLYN, NY 11229
BROOKLYN USERS GROUP, 1735 EAST 13TH STREET, APT 7N, BROOKLYN, NY 11229-1950
CPA APPLE UG, C/O BARRY LEIF, 469 SEVENTH AVE., NY, NY 10018
CPM/APPLE UG, 737 EMPIRE AVENUE, FAR ROCKAWAY, NY 11691
CP/M UG, 345 E. 86 ST., NY 10028
CPM USER GROUP, RT. 1 BOX 244, MILL RD., YAPHANK, NY 11980
COCO NEWS, 3 BOHR CT., SPRING BALLEY, NY 10977
COLOR COMPUTER CLUB OF NEW YOUR, 347 WEST 48TH ST., NYC 10036
THE COMPUTER & INFORMATION SOCIETY, C/O DANIEL J. LUGO, 145 W. 86th St. NY, NY 10024
COMPUTER CLUB OF AMERICA AND EXCHANGE, POB 784, BRONX, NY 10473
CRAB APPLE, POB 268, WEST NYACK, NY 10994
DATA GENERAL USERS NETWORK, C/O DAVID BELLIN, POB 929, FLUSHING, NY 11354-0929
DIGITAL GROUP INDEPENDENT USER'S GROUP, POB 316, WOODMERE, NY 11598
EUROPEAN APPLESHARE, c/o CNOBG, CHRIS STONE, APO, NY 09285
EXPLORER 85 CLUB, C/O JUAN VALENCIA, 142-15 CHERRY AVE, FLUSHING, NY 11355
FUTURE COMPUTER PRODUCTS UG, 67 MAPLE ST., NEWBURGH, NY 12550
HEATH UG OF NJ, C/O RALPH BRADBURN, 300 RT. 59, TALLMAN, NY 10982
HEATH UG OF NJ, (HUGNJ), C/O RALPH BRADBURN, 300 RT. 59, TALLMAN, NY 10982
IBM PC USERS GROUP, 290 CENTRAL AVENUE, SUITE 113, LAWRENCE, NY 11559 (516) 239-8885
INTERCALC, POB 254, SCARSDALE, NY 10583
JERI-HUG, 'THE HEATH UG', C/O HEATHKIT ELECTRONICS, 15 JERICHO TURNPIKE, JERICHO, NY 11753
JINSAM UG, C/O JAMES P. ISCARO, PRES., BOX 274, RIVERDALE, NY 10463
KAYPRO UG, POB 100, MALVERNE, NY 11565
KINGS BYTE NEWSLETTER, 1063 EAST 84TH STREET, BROOKLYN, NY 11236
LION, LONG ISLAND OSBORNE NETWORK, POB 190, OCEANSIDE, NY 11572
LIST (LON GISLAND SINCLAIR-TIMEX) GROUP, 10 IDLE DAY DRIVE, CENTERPORT, NY 11721
LNW UG, RT. 1 BOX 244, MILL RD., YAPHANK, NY 11980
LONG ISLAND COMPUTER ASSOC., POB 71, HICKSVILLE, NY 11802
LONG ISLAND NEC UG, 75 WEAVING LN., WANTACH, NY 11793
MCKOWNVILLE IBM PC USERS GROUP, C/O EDWARD DE VARENNES, 27 NORWOOD STREET, ALBANY, NY 12203
METRO TRS-80 UG, C/O GEORGE MUEDEN, 310 WEST 106 STREET, 15D, NYC 10025
ATARI COMPUTER OWNERS OF ROCHESTER, NY (ACORN), P.O. BOX 855, FAIRPORT, NY 14450
COLOR COMPUTER USERS GROUP OF ROCKLAND P.O. BOX 131, MONSEY, NY 10952-0131
CP/M OSBORNE KAYPRO EXCHANGE USERS GROUP (COKE/UG) C/O LAWRENCE C. YARNELL, Jr., APO NEW YORK 09086-5000
THE EDUCATORS' USERS FORUM C/O PAM HALE, 50A SOUTH MAIN STREET, SPRING VALLEY, NY
MICRO-COMPUTER BUSINESS UG, 161 W. 75 ST., NYC 10023
MOD 4 UG, 1578 E. 26 ST., BROOKLYN, NY 11229
N.E.C.A., 11 DICKENS AVE., DIX HILLS, NY 11746
NATIONAL ADVANCED STOCK/COMMODITY MICRO GROUP, LOCK BOX 219, NYC 11362
NEW YORK LAP USERS' GROUP c/o GEORGE MUEDEN, 310 WEST 106 ST 15D, NY, NY 10025, 212-222-8751
NEW YORK PERSONAL COMPUTER INC., SUITE 614, 80 WALL STREET, NEW YORK, NY 10005
NYU DISABLED STUDENT SERVICES, 566 LAGUARDIA PLACE, ROOM 701, NY, NY 10012
NY AMATEUR COMPUTER CLUB, INC., POB 106, CHURCH ST. STATION, NYC 10008
NY SANYO USER GROUP, POB 182, TIMES PLAZA STATION, NY 11217
NORTH COUNTY TRS-80 2 & 16 CLUB, 24 WOODLAND TERRACE, LAKE PLACID, NY 12946
OLYMPIAN COMPUTER CLUB, C/O PAUL A. MULLENS, BOX 4277, APO NY 09223
OMEGASOFT ENTERPRISES, 27 BANK STREET, LEROY, NY 14482 (716) 768-8814
PC BOOKS USER GROUP, (IBM/APPLE/COMMODORE) P.O. BOX 100, HENRIETTA, NY 14692
The PEOPLE TO PEOPLE SHUTTLE USERS GROUP -1, COMMODORE, P.O. BOX 1292, LOCKPORT, NY 14094
PET PLACE, C/O BRIAN SPECTOR, 6 CAIL DR., E. ROCKAWAY, NY 11518
RICHARD G. WINSTON, DDS, 135 3RD ACENUE, MINEOLA, NY 11501
ROCHESTER AREA COMP, 1 LOMB MEM DR., ROCHESTER, NY 14623
S-100/CPM USER'S GROUP, POB 106, CHURCH ST. STATION, NYC 10008
SCHENECTADY HUG, C/O T. BUDGE, 75 SANDERS, ST., SCOTIA, NY 12302, WALTER HIPPLE 385-5660
SINCLAIR COMPUTER USER'S SOCIETY (SINCUS), POB 36, JOHNSON CITY, NY 13790
SMUG TI UG, C/O RIGH CLEMENTS, DEPT. 444, COLESVILLE RD., BINGHAMTON, NY 13902
SOUTHERN TIER APPLE USER'S GROUP, (S.T.A.U.G.), POB G, BREESPORT, NY 14816
STATEN ISLAND APPLE UG, POB 141, STATEN ISLAND, NY 10305
STUDENTS AND TEACHERS COMPUTER USERS GROUP c/o NICK DUDISH, GROS BLVD., HERKIMER, NY 13350
SUFFOLK COUNTY COMPUTER ASSOCIATION, RT. 1, BOX 244, MILL RD, YAPAHANK, NY 11980
SYBIL'S M.U.G. UG, RT 52, CARMEL, NY 10512
SYRACUSE APPLE UG, POB 6586, SYRACUSE, NY 13217
SYRACUSE OSBORNE UG (SOUP), C/O MARTIN SHAPIRO, 601 CLAREDON ST., SYRACUSE, NY 13201
T.I. 99ER UG, POB 544, Deer Park, NY 11729
TS USERS XII, Arthur A. Schaefer, 112 Wendel Ave., Buffalo, NY 14223
THE BASIS GROUP INT'L, NY CHAPTER, C/O BILL BASCH, 127 MADISON AVE., 2ND FLOOR, NYC 10016
THE DATAMERICA COMPUTER USER'S GROUP, 312 E. 84 ST. #1A, NYC 10028
THE ROCHESTER S-80 COMPUTER CLUB INC., POB 15476, ROCHESTER, NY 14615
THE SYRACUSE APPLE UG, POB 6586, SYRACUSE, NY 13217
TRI-COUNTY NY, NY CROMENCO U.G., C/O CHARLES PERRELLA, 45F RT 303, VALLEY COTTAGE, NY 10989
TRS 80 USER GROUP, RT. 1, BOX 244, MILL RD., YAPAHANK, NY 11980
TRS-80 UG OF CENTRAL NY, 2362 EAST LAKE ROAD, SKANEATELES, NY 13152
U.A.U.G., C/O UPSTATE COMPUTER SHOP, 99 COMMERCIAL DR. 5A, WHITESBORO, NY 13492
UPSTATE 99/4A UG, POB 13522, ALBANY, NY 12212
UPSTATE NY ATARI COMPUTER ENTHUSIASTS, C/O DALE WHITNEY, BOX 232 MORRIS BLVD., CONKLIN, NY 13748
VAN RENSSELAER COMPUTER USER GROUP, ST. ANTHONY ONHUDSON, WASHINGTON AVE., RENSSALAER, NY 12144
WESTCHESTER FAIRFIELD AMATEUR COMPUTER SOCIETY, R.R. 1, BOX 176, POUND RIDGE, NY 10576
WESTCHESTER PET USER GROUP, POB 1280, WHITE PLAINS, NY 10602
WESTERN NEW YORK ATARI USER'S GROUP, P.O. BOX 59, BUFFALO, NY 14216
MICROPRO USERS GROUP OF AMERICA, 140 RIVERSIDE DRIVE, NEW YORK, NY 10024
N.Y. ON-LINE COMMODORE USER GROUP, BOX 8255, JACKSON HEIGHTS, NY 11372
LONG ISLAND VIC SOCIETY (LIVICS), C/O LAWRENCE STEFANI, 20 SPYGLASS LANE, EAST SETAUKET, NY 11733

NORTH CAROLINA

ACUSOFT ATARI COMPUTER USERS SOCIETY OF FAYETTEVILLE, PO BOX 1117, FAYETTEVILLE, NC 28302
APPLE CLUB OF FAYETTEVILLE, PO BOX 70, FAYETTEVILLE, NC 2802
THE APPLE SOUTHEASTERN INFORMATION EXCHANGE (T.A.S.I.E.), P.O. BOX 5404, STATION 1, WILMINGTON, NC 28403
CUGOF, PO BOX 41601, FAYETTEVILLE, NC 28309
CAPE FEAR COMPUTER AND HEATH USER'S GROUP, 2454 VANDEMERE AVENUE, FAYETTEVILLE, NC 28304
CAROLINA APPLE CORE, PO BOX 31424, RALEIGH, NC 27622
CHARLOTTE 99/4A USERS, 2637 CONNEMARA DR., MATTHEWS, NC 28105
CHARLOTTE 99/4A USERS, 2637 CONNEMARA DR., MATTHEWS, NC 28105
CHARLOTTE ATARI-USERS GROUP, 5911 BROOKHAVEN ROAD, NC 28208 (704) 333-0702
GEMS, GREENSBORO EIGHTY MICROCOMPUTER SOCIETY, PO BOX 10014, GREENSBORO, NC 27404
GUILFORD 99ER USERS GROUP, (TI 99/4A), PO BOX 21691, GREENSBORO, NC 27420
MICRO COMPUTER USERS CLUB, RT. 1 BOX 134-A, BOONVILLE, NC 27011
MICRO COMPUTER USERS GROUP OF RALEIGH, 5225 N. BOULEVARD, RALEIGH, NC 27604
NATAHALA COMPUTER CLUB (99'ERS), RT. 3, BOX 64-E, ROBINSVILLE, NC 28771
NATIONAL SOCIETY OF MICROCOMPUTER USERS AND GROUPS, PO BOX 8084, GREENVILLE, NC 27834
PIEDMONT TRIAD ATARI USERS GROUP, 6104 KNIGHT ROAD, GREENSBORO, NC 27410
RALEIGH COLOR COMPUTER CLUB, PO BOX 681, GARNER, NX 27259 C/O DAVID ROPER
RALEIGH OSBORNE COMPUTER CLUB, PO BOX 53754, FAYETTEVILLE, NC 28305
TACC, POB 17523, RALEIGH, NC 27619
TACS, PO BOX 7073, GREENSBORO, NC 27417-0073
TIMEX USERS GROUP, RT. 3 BOX 64E, ROBINSVILLE, NC 28771
TITAN'S USERS GROUP AMNON NISSAN, 5421 WAYNE ST., RALEIGH, N.C. 2760 (919)851-7609
TRIAD AMATEUR COMPUTER SOCIETY, PO BOX 7073, GREENSBORO, NC 27417
TRIANGLE SINCLAIR USER'S GROUP, C/O DOUGLAS DEWEY, 206 JAMES ST., CARRBORO, NC 27510
WILMINGTON TRS-80 USERS GROUP, 1605 PRINCESS ST., WILMINGTON, NC 28401
WILSON TRS-80 USERS' GROUP, PO BOX 336, LUCAMA, NC 27851
CUMBERLAND COUNTY KAYPRO-CP/M PORTABLES USERS GROUP, 5102 CATALPA ROAD, FAYETTEVILLE, NC 28304

NORTH DAKOTA

BASE COMPUTER HOBBYISTS GROUP, C/O 101-1 AVION WAY, MINOT AFB, ND 58704
GRAND FORKS IBM PC U.G., 717 IVES STREET, BUXTON, ND 58218
M.A.D. H.U.G. 99/4A, DENNIS SCHJELDAHL, 509 REEVES DRIVE, GRAND FORKS, ND 58201
TRS-80 COLOR COMPUTER CLUB, PO BOX 218, MINOT, ND 58701

OHIO

A-BUG-BYTE, C/O RON GABLE, 10781 W. NATIONAL RD., BROOKVILLE, OH 45309
ACE (ATARI UG OF COL.), 6632 LISAMARIE RD., COLUMBUS, OH 43229, C/O ED BILL ECKERT
AD A STAR (ATARI MICROCPU NET), C/O JACK McKIRGAN 2 WD88NG, 4749 SR 207 NE WASHINGTON C.H., OH 43160
AIM-65 USER'S GROUP, C/O DONALD CLEM, RR #2, SPENCERVILLE, OH 45887
AKRON-CANTON PC USERS GROUP, P.O. BOX 334, 1570 WOOSTER AVE., AKRON, OHIO 44320
AKRON IBM PC CLUB, BOX 1205, AKRON, OH 44309
AMATEUR COMPUTER SOCIETY OF CENTRAL OHIO (ACSCO), PO BOX 28606, COLUMBUS, OH 43228-0606
APPLE SIDERS, C/O DAN McKEE, 5001 RELLEUM AVE., CINCINNATI, OH 45238
APPLE-DAYTON USERS GROUP, POB 1666, FAIRBORN, OH 45324
ATARI USERS GROUP, 6895 N. HIGH ST., WORTHINGTON, OH
BUCKEYE 99ers, 2424 MANSFIELD-LUCAS RD., MANSFIELD, OH 44903
CABUG (CLEVELAND AREA BBS USERS GROUP, C/O COMPUTER EXPERIENCE, 36212 EUCLID AVENUE, WILLOUGHBY, OH 44094
CCC (RS COLOR CPU), PO BOX 478, CANFIELD, OH 44406-0478, C/O ED GINNY KOMARA
CENTRAL OHIO ADAM USERS GROUP, 730 THURBER DR. APT. N, COLUMBUS, OH 43215
CENTRAL OHIO COMMODORE USERS GROUP, P.O. BOX 28229, COLUMBUS, OH 43228-0229
CENTRAL OHIO 99ers, 1456 GRANDVIEW AVE., COLUMBUS, OH 43212
CIN-DAY TI USER GROUP, PO BOX 519, WESTCHESTER, OH 45069-0519
CINCINNATI COMP CLUB, 6515 KENVIEW DR., CINCINNATI, OH 45243
CINCINNATI COMPUTER CLUB, ‡@@ CONVERSE DRIVE, CINCINNATI, OH 45240
CINTUG, PO BOX 3991454, CINCINNATI, OH 45239 (513) 474-2983
CLEVELAND DIGITAL GRP, PO BOX 17440, CLEVELAND, OH 44117
COACH (APPLE UG) OF COLUMBUS, C/O JAY WRIGHT, 1887 WILLOWAY CIRCLE N., COLUMBUS, OH 43220
COGWHEELS CINCINNATI OSBORNE GROUP, 6404 COFFEY ST., CINCINNATI, OH 45230
COKUG, CENTRAL OHIO KAYPRO USERS GROUP, C/O I. WEISS, 3775 DANUBE DRIVE, GROVE PORT, OH 43125
COLOR COMPUTER CLUB, PO BOX 478, CANFIELD, OH 44406
COLUMBUS CP/M-ACSCO USERS, BOX 28606, COLUMBUS, OH 43228-0355
COLUMBUS MAX80 USERS, (M.A.X.U.G.), BOX 28606, COLUMBUS, OH 43228-0355
COLUMBUS TRS-80 COLOR COMPUTER USERS, C/O GARY DAVIS, 2153 LEAH LN., REYNOLDSBURG, OH 43068
COLUMBUS VIC-20 USERS GROUP, 169 N. VINE, WESTERVILLE, OH 43081, C/O LEN HOLLAND
COMMODORE USER GROUP, c/o JEFF EKLUND, 702 PARK AVE., NW, NEW PHILADELPHIA, OHIO
COOUG, CENTRAL OHIO OSBORNE USERS GROUP, DEVRY INST., 1350 ALUM CREEK DRIVE, COLUMBUS, OH 43209 C/O DALE BROWN
CUYAHOGA VALLEY ATARI COMPUTER CLUB c/o James Stewart, Pres., 2111 18th St. SW., Akron, Ohio 44314, (216)753-5811 after 5:00 pm
CUYAHOGA VALLEY COMPUTER CLUB, C/O BRIAN HEIN, 3053 ROHRER RD., WADSWORTH, OH 44281
DATUG, C/O THOMAS H. MAGEE, 3360 Fair Oaks Dr, Xenia, OH 45385
DAY-ATARI, 1461 HUFFMAN AVE., DAYTON, OH. 45403
DAYTON MICROCOMPUTER, 2629 RIDGE AVE., DAYTON, OH 45414
DAYTONIAN COMMODORE TELE-COMPUTE USERS GROUP, PO BOX 24443, DAYTON, OH 45424
DELAWARE OHIO VIC-20 USERS GROUP, PO BOX 216,NEW ALBANY, OH 43054, C/O TOM MARTIN 855-2404
ED YORK CIN DAY USER GROUP, P.O. BOX 519, WESTCHESTER, OH 45069 513-777-0110
ENGLEWOOD COMPUTER USERS GROUP, 313 CANDY LANE, UNION, OH 45322 (513) 836-3273
GOODYEAR COMPUTER CLUB, GOODYEAR TIRE CO., AKRON, OH 43316
THE GREATER CLEVELAND AREA SINCLAIR USERS GROUP, 6514 BRADLEY AVE., PARMA, OH 44129
IBMACSCO, C/O NEIL, BOX 16086, COLS, OH 43126**NEO LAKE ASHTABULA IBM PC UG**, POB 175, MADISON, OH 44057
LIMA AREA TI 99/4A USERS GROUP, 1513 WEST WAYNE STREET, LIMA, OH 45805
NEO APPLE CORPS, C/O BOB ABBOTT, 1935 MATTINGLY RD, HINCKLEY, OH 44233
NEW HORIZONS, WILLIAM SAGER, 612 MEADOW SPRING, MAUMEE, OH 43537
NORTHEAST OHIO COMMODORE USERS GROUP, 5104 MAYFIELD DR., LYNDHURST, OH 44124
THE OHIO VALLEY COMPUTER CLUB, 5A475 NORTH OVERLOOK DRIVE, WINTERSVILLE, OH 43952 (614) 264-6820
OH-MI-TI, DON WOLLENBECKER, 1522 RESWICK, OREGON, OH 43616
OSBORNE USERS OF COL., OHIO INST. OF TECH, 1350 ALUM CREEK DR., COLUMBUS, OH 43209, C/O BILL HOOKER/ DALE BROWN
OSI, NORTH COAST USER'S GROUP, 30600 NAMHAHASSET RD., BAY VILLAGE, OH 44140
ROBOTICS USERS GROUP, APRIL LANE, COL., OH
RUBBER APPLE USERS GROUP, ROBERT M. NEBIKER, 1870 BROOKFIELD DRIVE, AKRON, OH 44313
SAUCE - STARK APPLE USERS COOPERATIVE EXCHANGE, c/o Ralph Arnold, PO BOX 35474, CANTON, OH 47735
SAUCE, STARK APPLE USERS COOPERATIVE EXCHANGE, PO BOX 35091, CANTON, OH 44735
SANYO USERS OF CENTRAL OH, C/O ARNIE SKUROW, 5760 CRAWFORD DR., COLUMBUS, OH 43229
SCREAMING EAGLES, C/O DAVID YAROS, 1006 2ND NAT'L BLDG., CINCINNATI, OH 45202
SOUTHEASTERN OHIO COMPUTER SOCIETY, PO BOX 67, CAMBRIDGE, OH 43725
THE LAKE ASHTABULA IBM PC USERS GROUP, PO BOX 175, MADISON, OH 44057
NEO APPLE CORPS, C/O BOB ABBOTT, 1935 MATTINGLY ROAD, HINCKLEY, OH 44233
THE NORTHCOAST 99'ers, P.O. BOX 23283, EUCLID, OH 44123 (216) 357-7274
THE PSYCHOLOGICAL COMPUTER CLUB, 2118 FOREST LAKE DRIVE, CINCINNATI, OH 45244
TIMEX-P.O.R.T.S. PORTSMOUTH, OHIO REGION TIMEX AND SINCLAIR USER GROUP, 2002 SUMMIT ST., PORTSMOUTH, OH 45662
TIMEX/SINCLAIR USERS GROUP, 4255 S. HAMILTON, COL., OH
TRI-STATE OSI USERS, C/O TED MORRIS, 6306 KINCAID RD., CINCINNATI, OH 45213
TRS-80—ACSCO, BOX 28606, COLUMBUS, OH 43228
TRS-80 COLOR COMPUTER USERS GROUP, 527 MALVERN DRIVE, PAINESVILLE, OH 44077, C/O ANTHONY RUQUE
TUSCARAWAS COUNTY PERSONAL COMPUTER CLUB, C/O ROBERT D. HOBART, 231 5TH DR. NW., NEW PHILADELPHIA, OH 44663
Z80 NEVADA COBOL USER'S (NUG), BOX 28606, COLUMBUS, OH 43228
ZORBA EQUIPMENT USERS GROUP (ZEUS), BOX 1112, ATHENS, OH 45701
CARNATION CITY 99'ERS, C/O DAVE BRAIN, 205 FERNWOOD BLVD., ALLIANCE, OH 44601
THE GREATER CLEVELAND AREA SINCLAIR USERS GROUP, C/O JAMES G. DUPUY, 6514 BRADLEY AVE. (DOWN), PARMA, OH 44129

OKLAHOMA

AUTUMN REVOLUTION, PO BOX 55329, TULSA, OK 74115, (918) 663-3436
BARTLESVILLE MACINTOSH USERS GROUP (BMUG), C/O MARION DELAHAN, 6523 TRAIL DRIVE, BARTHESVILLE, OK 74006
BIG RED APPLE GROUP, 2301 W. MAIN ST., NORMAN, OK 73069
CPM-OK USERS GROUP 3100 OVERHOLSER DRIVE, OKLAHOMA CITY, OK 73127
CENTRAL OKLAHOMA 99ERS, 307 W. RICKENBACKER DR., MIDWEST CITY, OKLAHOMA 73110
GREEN COUNTRY COMPUTER ASSOCIATION, PO BOX 2431, TULSA, OK 74101, (918)245-3456
OKLAHOMA LOCAL OSBORNE GROUP, PO BOX 1851, BETHANY, OK 73008
SOONER 99'ERS USERS GROUP, PO BOX 96893 OKLA CITY, OK 73129 (405)631-1422
TIMEX SINCLAIR USERS GROUP, C/O BILL CASEBEER, PO BOX 372, OOLOGAH, OK 74053
TULSA AREA COMMODORE USERS GROUP, C/O CRAIG BOWMAN, SECRETARY, DONALD BARNWELL, PRESIDENT, 7804 N. 117TH E. AVE., OWASSO, OK 74055 (918)272-9755
TULSA COMPUTER SOCIETY, PO BOX 1133, C/O SI HAWK, TULSA, OK 74105, 918-446-5219
NATIONAL PCjr USER'S GROUP, C/O DAVID WOLLMANN, 1504 E. 71ST PLACE,#1308, TULSA, OK 74136
TULSA REGIONAL ATARI COMPUTER ENTHUSIASTS (T.R.A.C.E.), P.O. BOX 4823, TULSA, OK 74159

OREGON

APPLE BLOSSOM, PO BOX 266, DILLIARD, OR 97432
APPLEUGENE, PO BOX 3267 EUGENE, OR 97403
APRICOT COMPUTER TECH. GROUP, c/o J. WEST, BOX 967, SALEM, OREGON 97308
ATARI COMPUTER ENTHUSIASTS, 3663 VINE MAPLE ST., EUGENE, OR 97405, C/OMICHAEL DUNN
COOS COMPUTER CLUB, P.O. BOX 4066, EASTSIDE, OR 97420
CP/M USER'S GROUP NORTHWEST, 1346 N.E. 28TH, PORTLAND, OR 97232
DOCTOR'S COMPUTER COMMITTEE, 2188 SW PARK PLACE, PORTLAND, OR 97205
EUGENE 99/4A USER GROUP, P.O. BOX 11313, EUGENE, OR 97440
EUGENE PCjr CLUB, P.O. BOX 3695, EUGENE, OR 97403
JACKSON AMATEUR COMPUTER SOCIETY, 2355 CAMP BAKER RD., MEDFORD, OR 97501
MICRO-CALC BUSINESS USERS GROUP, PO BOX 12039, SALEM, OR 97309
NORTHWEST SANYO ENTHUSIASTS, 5687-H SE INTERNATIONAL WAY, MILWAUKEE, OR 97222
PACIFIC NORTHWEST COMMODORE USERS GROUP, PO BOX 2310, ROSEBURG, OR 97470
PORTLAND AREA TRS-80 USER'S GROUP, PO BOX 02500, PORTLAND, OR 97202
PORTLAND ATARI CLUB, P.O. BOX 1692, BEAVERTON, OR 97005
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NAME: UPTOWN SOFT-PACK
TYPE: Business Programs for Amway Product Distributors
COMPUTER: Commodore 64 System only
DESCRIPTION: This 4 disk software package offers exactly what most Amway product distributors need for their business. The product order program, with over 1,000 products on disk file plus manual product entry, prepares your SA-1. Also included are a performance bonus, label/name file, and a home business expense program. This package will save the average distributor 50-75% of their paperwork time. Product file updates and individual program disks are available.
PUBLISHER: Uptown Enterprises, P.O. Box 226, Verona, VA 24482, (703)248-6888
COST: $150.00

NAME: PHYSICALC
TYPE: Educational program
COMPUTER: IBM PC/XT/jr/AT, Apple II+/IIe/IIc
DESCRIPTION: This program presents an introduction to the concepts of physics. The major areas of mechanics, gravity, light, quantum mechanics and relativity are reviewed and explained. 30 key equations of physics are presented, which the student can easily use on screen for calculations. The material is suitable for anyone 7th grade and up who is interested in physics, to use at home or in the classroom. The program is easy to use with a main menu to select activities and you can proceed at your own pace of learning. The material is well organized to use for review after initial learning is completed.
PUBLISHER: Zephyr Services, 306 S. Homewood Avenue, Pittsburgh, PA 15208; (412) 247-5915
COST: $39.95 (plus $2.00 shipping)

NAME: SUPER FACTORY
TYPE: Educational program
COMPUTER: 64K Apple II
DESCRIPTION: This time-tested program encourages users to invent geometric "products" and invites them to dupliate designs turned out by friends. This program takes young inventors from grades six and up into the often neglected world of three dimensions. As they Research, Design and take on the Challenge of matching cubes created by classmates, students begin to think in three dimensions. At the same time, they practice problem-solving strategies of working backwards, analyzing a process and finding a sequence. The Super Factory is designed to take the study of three-dimensional shapes off the "back burner" and into the traditionally two-dimensional world of the classroom.
PUBLISHER: Sunburst Communications, Inc., 29 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934; in New York, Alaska and Canada call collect at (914) 769-5030.
COST: $59--includes one diskette, backup and teacher's guide; $177 (computer lab package)--contains 10 diskettes and teacher's guide

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NAME: SAMARITAN CHURCH SOFTWARE
TYPE: Church Management System
COMPUTER: IBM PC's and IBM compatibles
DESCRIPTION: This program is a comprehensive software package for all church accounting, record-keeping and member communications, is available to churches of all denominations through a national dealer network. This Samaritan package includes software modules for Family Census, pledges and Contributions, and Attendance. The Samaritan system provides instant, accurate, up-to-date church financial and family data. By handling a major share of church administrative functions with remarkable speed and accuracy, Samaritan alloiws church staff to devote more time to spiritual matters and to the personal aspects of their ministry.
PUBLISHER: Word & Data Software, Inc., 333 S. 78th Street, Omaha, Nebraska 68114; (402) 397-1555
PRICE: Not provided

NAME: SUM-UP
TYPE: Calculator Program
COMPUTER: Model I, III, and two Model 4 versions
DESCRIPTION: With this program adding, subtracting, multiplying, and dividing can pops up over almost an application program. This program also contains a decimal to hexidecimal converter. The user simply loads Sum-Up, then loads his application program. When he needs a calculator, he presses <CTRL> + C. Up pops the Sum-Up calculator box. Adding, subtracting, multiplying, and dividing can be done by forward or reverse notation. Pressing "x" restores the program and screen as it was before involving the calculator.
PUBLISHER: AlphaBit Communications Inc., 13349 Michigan Avenue, Dearborn, MI 48126; (313) 581-2896
COST: $24.95

NAME: DATE TICKLER
TYPE: Management Software Package
COMPUTER: Apple II, IIe, IIc
DESCRIPTION: This program is a calendar scheduling, appointment book, management software package. It schedules up to 100 appointments at one time up to the year 2000. Insertion of appointments can be in any format up to 127 characters. Entries can be alphabetised, arranged chronologically by times, or rearranged in any other manner chosen. The unique function of Date Tickler is its "tickling" function which will remind the user of upcoming events in however many days specified when entering appointments. With just a few keystrokes specific engagements can be found through a search option by key words, phrases or numbers and then printed.
PUBLISHER: Allegory & Company, P.O. Box 3540, Berkeley, CA 94703; (415) 428-1156
COST: $37.50 plus $1.50 shipping charges

NAME: CHECKZ
TYPE: Check Maintenance Program
COMPUTER: ALL
DESCRIPTION: This program is a comprehensive checking account maintenance program for small businesses and individuals. All program functions are menu selected an online help is available from each of the menus. Its low price and large number of features make it a good buy in today's software market and an outstanding price/feature value. It is fast and memory-efficient in operation and very easy to use and understand.
PUBLISHER: Future Communications, 210 West Benson Street, Atlanta, GA 30030; (404) 373-4831
COST: $49.95

NAME: THE OREGON TRAIL
TYPE: Educational Program
COMPUTER: Apple II
DESCRIPTION: With this program students make vital pre-journey decisions and then re-enact day-to-day movement westward as they experience what life was like for overland emigrants in the years before the Gold Rush. They can stop to "size up" their situation and change survival strategies, such as adjusting their pace or food rations. In addition, six climate areas vary the weather across the prairies, plains, and mountains, affecting the health of pioneers and the rigors of their journey. Full color graphics depict landmarks, forts, and rivers along the trail, where travelers can stop to talk to the folks living there and perhaps buy extra supplies. Hazardous river crossings and opportunites to hunt along the way add the challenge and excitement. There's even an option for the program to periodically play eighteen authentic tunes from the 1840's.
PUBLISHER: Minnesota Educational Computing Corporation, 3490 Lexington Avenue North, Saint Paul, MN 55126-8097; (612) 481-3500
COST: Not provided

NAME: QUICK-LOOK TAX PLANNER
TYPE: Accounting Program
COMPUTER: IBM PC
DESCRIPTION: This program will reduce hours of calculating tax figures into seconds. It projects both the current and subsequent year's tax liabilities at the punch of a button. Quick-Look's enhancements allow it to run with no fixed disk required. The system's speed has been increased through the use of a Micro Focus Compiler. This program has been updated to increase the efficiency and productivity of the accountant's operations. This program is backed by the MCS Client Support Team. The Client Support Team, reachable through a toll-free number, is on duty 11 hours a day, five days a week. This telephone support system allows users to speak with the professionals who designed and produced the software.
PRODUCER: Management Control Systems (MCS), a division of Informatics General Corporation, (800) 241-3306 (In U.S.); (800) 282-4170 (In Georgia); (404) 432-1996 (In Alaska and Hawaii)
COST: $350.00

NAME: MAGIC SERIES
TYPE: Typesetting Utility
COMPUTER: MS-DOS or CP/M-based computer

Continued On Next Page

DESCRIPTION: This program provides easy font selection, versatile line drawing, variable boldfacing, kerning in 720th-inch increments, graphics merging, adjustable width tables, odd/even page batch printing and typewriter mode. This program has all the features available with other MagicSeries products, including automatic column printing, flexible footnoting, file merging and multi-tier indexing. The unique combination of sophisticated formatting features and tru proportional spacing helps MagicSeries give a typeset look to the printout of ordinary office computer systems. The printout is professional-looking, without crowded characters or oversized gaps in the text. In addition since MagicSeries works with the text editor already in place, the user can have all the benefits of a superior word processor without having to spend the time and money required to learn all the ins and outs of an entirely new system, retype old files and retrain staff. MagicSeries has three modules.

PUBLISHER: Computer EdiTpe Systems, 509 Cathedral Parkway, Suite 10A, New York, NY 10025; (212) 222-8148

COST: MagicPrint: $195; MagicBind: $250; MagicIndex: $295

NAME: AMAZON
TYPE: Game Program
COMPUTER: Apple Macintosh; Apple IIe; IBM PC/PCjr; Commodore 64 and 128
DESCRIPTION: This game incorporates an advanced parser system with state of the art graphic techniques. The game understands a full vocabulary of several hundred English words, and comes complete with a hint book and word list. In this game, the player is an agent for NRST, a high-tech research firm. The player's misison is a solo expedition to the Amazon; the goal is to locate the Lost city of Chak and to recover precious emeralds.
PUBLISHER: Tellarium Corp., One Kendall Square, Cambridge, MFA 02139; (617) 494-1200

COST: (Apple Macintosh) $44.95; (Apple II) $39.95; (IBM PC/PCjr) $39.95; (Commodore 64 and 128) $32.95

NAME: DRAGONWORLD
TYPE: Game program
COMPUTER: Apple Macintosh; Apple II; IBM PC/PCjr; Commodore 64 and 128
DESCRIPTION: This game incorporates an advanced parser system with state-of-the-art graphic techniques. This game understands a full vocabulary of several hundred English words, and comes complete with a hint book and word list. In this game the player is placed in the role of Amsel of Fandora, a kindly hermit who learns that his old friend, The Last Dragon, has been kidnapped. As he attempts to rescue his friend, Amsel encounters thieves, monsters, beggars and artists, each adding a new wrinkle to his quest.
PUBLISHER: Telarium Corp., One Kendall Square, Cambridge, MA 02139; (617) 494-1200
COST: (Apple Macintosh) $44.95; (Apple II) $39.95; (IBM PC/PCjr) $39.95; (Commodore 64 and 128) $32.95

NAME: FAHRENHEIT 451
TYPE: Game program
COMPUTER: Apple Macintosh; Apple II; IBM PC/PCjr; Commodore 64 and 128
DESCRIPTION: This game incorporates an advanced parser system with state of the art graphic techniques. This game understands a full vocabulary of several hundred English words, and comes complete with a hint book and word list. In this game the player is a member of the Underground in a society whose government is committed to controlling the populace by systematically destroyig all literature. The player's goal is to restore to the world the freedom it once had.
PUBLISHER: Telarium Corp., One Kendall Square, Cambridge, MA 02139; (617) 494-1200
COST: (Apple Macintosh) $44.95; (Apple II) $39.95; (IBM PC/PCjr) $39.95; (Commodore 64 and 128) $32.95

NAME: SIR ISAAC NEWTON'S GAMES
TYPE: Educational program
COMPUTER: Apple II, IBM PC and PCjr
DESCRIPTION: This program will help develop an intuitive understanding of the laws of motion; to help students understand how friction and other forces affect motion. Concepts of motion, previously reserved for students who have studied calculus, can now be identified and experienced by elementary school students. There are five simulations included in this game, they are: Track, Obstacle Course, Race, Tag, and Write Your Name. The teacher is guided towards effective uses of Sir Isaac Newton's games through pre-teaching and follow-up activities detailed in the program's Teacher's Guide.
PUBLISHER: Sunburst Communictions, Inc., 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934; (New York, Alaska and Canada call collect) (914) 769-5030
COST: $59--includes one diskette, backup and teacher's guide; $177 (computer lab package)--contains 10 diskettes and teacher's guide

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NAME: HIPPOWORD
TYPE: Word processing program
COMPUTER: Atari ST
DESCRIPTION: This program is a professional mouse-based word processor. HippoWord includes MacWrite like features such as multiple fonts, variable point size characters, variable attributes (e.g. boldface, outline), left/right justification, rulers and column editing. Hippoword works conveniently with HippoConcept and HippoSpell.
PUBLISHER: Hippopotamus Software, Inc., 985 University Avenue, Suite #12, Los Gatos, CA 95030; (408) 395-3190
COST: $89.95

NAME: HIPPOSIMPLE
TYPE: Database program
COMPUTER: Atari ST
DESCRIPTION: This program is a powerful, flexible, and easy-to-use database. HippoSimple allows users to keep track of information such as business contracts, sales prospects, phone numbers, and club membership lists in addition to budgets and accounts receivable and payable. The database features an easy-to-use mouse-based screen editor, sort (up to 16 levels), merge, data compression, mathematical sum, and over 10 programmable relationships, and can be used with any size mailing labels, envelopes or letterhead. The database provides predesigned templates and the ability to design custom templates. HippoSimple comes with a helpful on-line manual.
PUBLISHER: Hippopotamus Software, Inc,. 985 University Avenue, Suite #12, Los Gatos, CA 95030; (408) 395-3190
COST: $49.95

NAME: HIPPO CONCEPT
TYPE: Idea processor
COMPUTER: Atari ST
DESCRIPTION: This program is an idea processor for business plans, term papers, speeches, prposals, books and other documents. HippoConcept helps users organize thoughts, create drafts and expand each chapter individually. HippoConcept layers text to hide chapter details beneath chapter summaries and makes documents clearer and better organized. HippoConcept works with HippoWord and HippoSpell.
PUBLISHER: Hippopotamus Software, 985 University Avenue, Suite #12, Los Gatos, CA 95030; (408) 395-3190
COST: $89.95

NAME: HIPPO DISK UTILITIES
TYPE: Utilities Disk
COMPUTER: Atari ST
DESCRIPTION: This program allows users to recover deleted or lost files, reconstruct damaged disks, change file attributes, manage files on disk and edit RAM, tracks, sectors and files. Compatible with floppies and hard disks, the Hippo Disk Utilities come with a helpful on-line manual and a disk and memory map.
PUBLISHER: Hippopotamus Software, Inc., 985 University Avenue, Suite #12, Los Gatos, CA 95030; (408) 395-3190
COST: $49.95

NAME: HIPPOBACKGAMMON
TYPE: Game program
COMPUTER: Atari ST
DESCRIPTION: This program uses a sophisticated algorithm to allow Atari ST users to play challenging tournament backgammon at levels of difficulty ranging from beginner to expert. The game also demonstrated Artificial Intelligence (A.I.) theory by allowing the user to adjust hundreds of numbers to change the computer robot's playing personality. The user can also set up two different robot players and make the Atari ST play itself: HippoBackgammon will display the game in full color, animated graphics. HippoBackgammon uses a black and white or color monitor, keeps track of wins and losses on disk, allows doubling of games.
PUBLISHER: Hippopotamus Software, Inc., 985 University Avenue, Suite #12, Los Gatos, Ca 95030; (408) 395-3190
COST: $39.95

NAME: HIPPOSPELL
TYPE: Spelling corrector
COMPUTER: Atari ST
DESCRIPTION: This program is the fastest spelling corrector available for Atari ST. It's compatible with Atari ST editors and word processors including Express, STWriter and GEMWrite. HippoSpell provides comprehensive word frequency statistics, a 30,000-word dictionary (including prefixes and suffixes) and a user-defined word dictionary (up to 25,000 words). HippoSpell suggests correct spellings and comes with a helpful on-line manual.
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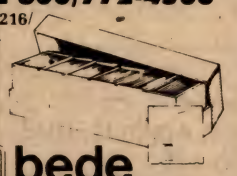

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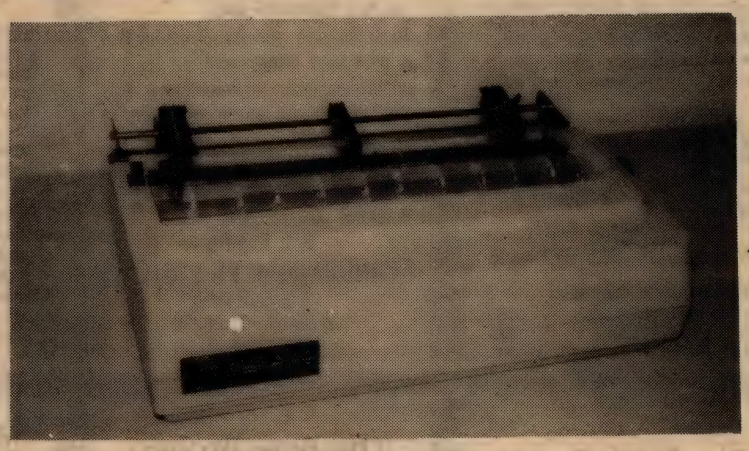

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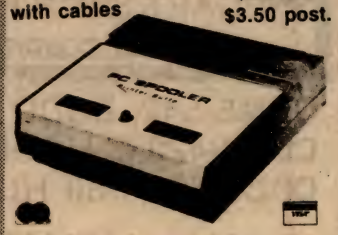

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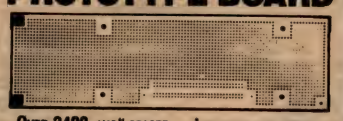

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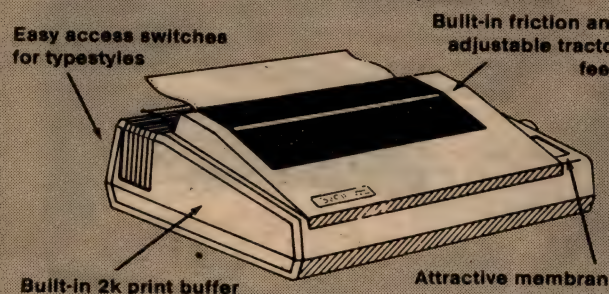
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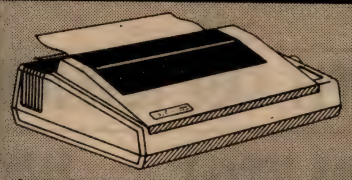

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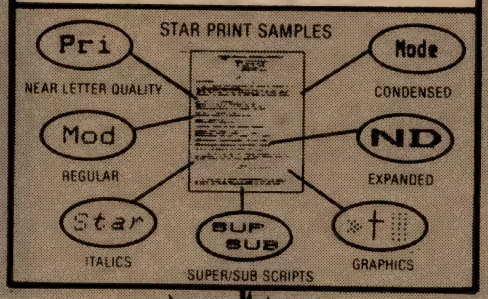

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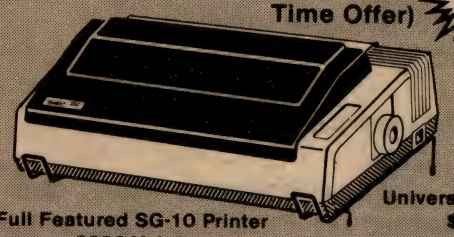

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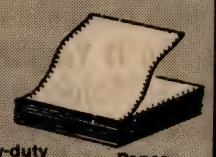

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CLASSIFIED INFORMATION

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In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.

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2. Write the desired category at the top of each ad. Please refer to the Index, this page. If a category is not indicated, ad will be placed in the Miscellaneous section.

3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

CLOSING DATE — 2nd Monday of the month. Example: Ads received by the 2nd Monday of February will appear in the April issue. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

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PROOFS

Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

PHOTOS

A photo will draw attention to your ad. Photos are $7.00 per column inch. Please send in B/W photos, preferable 4x5's cropped horizontally. Include your name and address on the back of **each** photo. If photo looks like it is more than one inch send in money for two inches or more.

★ **$5.00**

★ ★ **$4.00**

★ ★ ★ **$3.00**

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Have a special piece of equipment to sell? Reducing the price of an item and want to attract attention to that fact? Take advantage of our low price "star" attention getters.

It's a fact...unusual "artwork" in or above an ad draws attention that ad and the reader retains interest in that product longer.

GET RESPONSE QUICKER with "Stars" above your ad. Below is the rate for different sizes. Just mark "stars" and the price of the one you choose above your ad copy and we'll take care of the rest. Be sure to include the cost with your ad payment.

CS-ABBREVIATIONS

add-post . . . . . add postage
add-post-AP . . . add postage, all prices
FC . . . . . Freight Collect
MBG . . . . . money back guarantee
PP . . . . . postage paid
SASE . . . . . send self-addressed
. . . . . stamped envelope for
. . . . . check return or
. . . . . information requested
10 DRP . . . . . 10 day return privilege
CCR . . . . . check clearance required

EXAMPLE OF STYLES:

Normal

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at:
11/03 Computer $900
Dual RZ-1 disc $1,000
32KB memory $2,800

PDP 11/03 COMPUTER. Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at: 11/03 Computer $900. Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500. GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

10 Point Centered Head

PDP 11/03 COMPUTER

Complete **OPERATING SYSTEM** with RT-11 system software plus basic. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

Individual Listings

Intertube video terminal $400
John Doe, POB 1234, Somewhere, USA 00000. 123-456-7890.

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Copyright laws pertaining to software can be enforced. Due to the complexity of determining what software is legal or illegal, any and all liability for copyright violations shall rest solely upon the advertiser. Patch Publishing and its staff do not in any way condone or knowingly participate in any such illegal activity.

(101) TRS-80 COMPUTERS FOR SALE

★ ★ ★

B.B.I. WHOLESALE NETWORK- A membership B.B.I. for USED and NEW "Special Buy" computers. See display ad in **COMPUTER SHOPPER** Mart or call **916-344-1956.** 2-75

BUY/SELL USED COMPUTERS

Quick/Easy/Best value•Thousands of items• For sale by owners•National Listing Service•No Commission•Only $22.95 to list until sold!

1-800- TECTRAN

800-832-8726•VISA/MC Accepted•617-491-4888 2-74

Color computer, 2-DD, monitor, printer, much software for business, games, communications, etc. $550. **Keith Wood 415-824-8013.**

★ ★ ★

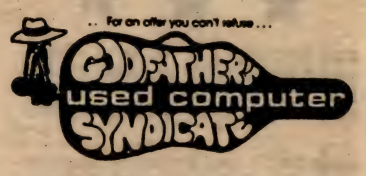
Comp-Used: Buy or sell Radio Shack or other systems, peripherals or software. Any computer product over $100, **203-762-8677.** 12-73

Complete TRS-80 Model II system with 12 meg HD, line printer 8, modem, scripsit, profile, disks, ribbons, documentation. **Guaranteed** excellent condition $1200. Contact: **Wesler, 212-628-0633,** if n.a. write 105 E. 67 St., NY, NY 10021. 2-76

For Sale: New merchandise for Coco's. Color power unlimited CPM board $300. Mark Data Keyboards $40. Botek Printer interfaces $40. **John Greve,** 3216-37 Ave., Rock Island, IL 61201. 1-73.

GOLD! - Recover pure gold from old scrap circuit boards, electronics, etc. Very easy. My book tells how. Send $25. **J. Sciuto,** Box 129, Methuen, MASS. 01844. 5-75

Junkman Will Buy! I buy old scrap IC's, relays, circuit boards, diodes, any mixed junk, gold plated, transistors, connectors, dirty, broken, smashed or useless electronic junk - any amount! 1930 to 1985. Nothing refused! 10 years in business. Pack in boxes and ship UPS. Fast payment! **JUNKMAN,** 103 Saratoga St., Lawrence, Mass. 01842. 9-73



2000 AT A STEAL!! Tandy 2000, 2 Drives, 256K, Monitor $1300 with 90 day warranty. **Godfather's Syndicate,** 1154 W. SR 436, Forest City, FL 32714 (305)774-1111. 01-73

We have a limited selection of Models I's, II's, III's, IV's, 12's, 2000. We align all drives before selling. Give a 90 day warranty. Buy-Sell-Trade-**Godfather's Syndicate,** 1154 W. SR 436, Forest City, FL 32714 (305)774-1111. 01-73

★ ★ ★

Model 100 Brand new 32K with some software $650. Phone **305-777-4663 or 305-773-3417.** 2-74

Model 16B, 64K, 2 drive, 12 Meg Hard Drive, Xenex Software and others, virtually unused system, $3900. **Computer Reset, 214-276-8072.**

Model II/12K w/12 meg HD and lots of software in perfect condition waiting for decent offer. **203-658-6319.** 2-75

Model II- 4 drives; Scripsit, profile+, forms, sort; Modem, buffer; DMP 400, $1500. **Robert Hansen,** 211 S. High, Galena, IL 61036. **815-777-2512.**

Model II, CP/M, 1-DD, monitor, $600; Daisywheel Printer II, $650. **Keith Wood, 415-824-8013.**

Model II Extra drive and PS loads of software. Many diskettes $1,150. **Perry Koenig,** 35W464 Country School Road, Dundee, IL 60118 **312-426-6224.** 2-74

Model II with 4 drives, $1000. Model I with 2 drives, 48K, gold plugs, RS-232, like new $600. Model II one bay expansion drive, $200. Model 12 new in box, $1,500. **Call Rick at 616-385-4109.** Visa/MC.

Model II with two disk drives, software, disks, excellent condition $595. **715-345-0781.**

Radio Shack Model II with 3 drives; Model 16B, w/2 drives. Multi Pen Plotter. First Reasonable Offer or trade. **Fla. 305-335-8192.**

TI 99/4A $35; TI Compact 40 $35. Call **Weber Systems 216-729-2858.** 1-73.

TRS-80 Line Printer VI, $200; TRS-80 model II expansion unit with 1 drive, $200; Call **Weber Systems, Inc. 216-729-2858.** 1-73.

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Classified Dept., COMPUTER SHOPPER
P.O. Box F, Titusville, FL 32781

To figure cost of ad, the rate is 17 cents per word, (34 cents per word bold face) $3.00 per ad minimum charge.

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You may run my ad _____ issues.

TRS-80 MODEL IV

Model IV for sale. Only 10 hours use, disk, 64k, Mem, software, only $699 or best offer. Call **Gary** after 4:30 est at **614-475-3315.** 1-74

TRS 80 Model I, Level 2, 48k, L.C., 1.77/3.55 Mhz. clock, monitor, cassette, late model keyboard, LNW expansion interface in custom enclosure, Aerocomp Doubler, one RS drive (TM100-1), Microtine 80 printer, complete $500. Sell all or part. Newdos 80 version 1 $25, Newdos 80 version 2, $50, MBE-XT bareboard w/docs, $30. **Evenings 213-691-2750.** 1-73.

Tandy 1000 Multifunction cards and hard drives. Call for information and literature. Hard drive specialist. 16208 Hickory Knoll, Houston, Texas 77059. **1-800-231-6671, 1-713-480-6000.** Dealer inquires invited. 11-73.

Tandy 1000, compatible with IBM, two disk drives, 128k, New cost $1500, now one year old and like new $850. **305-731-2759. 2-74**

Tandy 2000 256K, 2 disk, graphics board, monitor, multimate, softerm technical manuals and more. Excellent condition. Cables for printer and modem included $1750. **305-632-4894.**

(102) TRS-80 COMPUTERS WANTED

★ ★ ★

B.B.I. WHOLESALE NETWORK- A membership B.B.I. for USED and NEW "Special Buy" computers. See display ad in **COMPUTER SHOPPER** Mart or call **916-344-1956.** 2-75

HARD DISC 8 meg Primary or Secondary complete with cables, board if primary. Must be in working condition. Call **206-373-3113,** or write **Hart,** 3113 Rocky Point Road, Bremerton, WA 98312.

Interface with double density and RS-232 wanted for Model I, also need **Exatrow Drive or lynx** modem. **718-436-8463.** 12-73

I Buy, Sell & Trade TRS-80's for cash. **Godfather's Syndicate,** 1154 W. SR 436, Forest city, FL 32714. (305)774-1111. 1-73

WANTED: DOSPLUS, MSCRIPT, and NEWDOS+ for TRS-80 MI. JBC's TC-8 cassette system. **C.T. Huth,** 130 Hunter St., Tiffin, OH 44883. 10-73

WANTED: Damaged TRS-80 Model III's, send details to: **Old Model III Shop,** POB 613, Pocono Pines, PA. 18350-0613. 11-75

WANTED: TRS-80, M1L2 Late Model keyboard only. **Ernest Duval,** 203 Caroline St., Saratoga Springs, NY 12866. 11-74

Wanted: Mod I, 48K EI w/doubler, LC using sh/o keys. Disks if 40TR floppies (perfect). Write details use and asking price. **Hexco, Box 199, Hunt, TX 78204. 2-74.**

Wanted Model 12 TRS-80. **G.R. Morin,** RFD 6, Box 498, Laconia, NH 03246. **603-524-3451**

(103) TRS-80 SOFTWARE, PERIPHERAL

COBOL Development System for Radio Shack Model II-12, (original cost $995.), Unused and in original condition $250. Also, Complier Basic for Radio Shack Model II-12, (original cost $295), Original disk & documentation $75. **Rob Lee,** 25 Amaryllis Ave., Waterbury, CT 06710. 1-73

COBOL Development System for Radio Shack Model II-12, (original cost $995.), Unused and in original condition $250. Also, Complier Basic for Radio Shack Model II-12, (original cost $295), Original disk & documentation $75. **Rob Lee,** 25 Amarylis Ave., Waterbury, CT 06710. 1-73

COCO ADS- newsletter just for the TRS 80 Color Computer owner. Many programs, articles, reviews, a help column, clubs and BBS list. Send $.50 for sample copy to- **P.D. Software,** PO Box 13124, Houston, TX 77219. 1-77

Earn $1100 per Month with your TRS-80, Apple Commodore or IBM compatible. This program will allow you to enjoy a handsome full or part-time income working in your own home and setting your own hours. This unique program has been tested and used for over **seven** years and its service has had phenomenal acceptance. We provide all the know how, the consultation service, and all the materials needed to make this unusual business opportunity a success from the first day. If you like the idea of operating a highly profitable business out of your own home, if you like working with a computer and if you like making money, then this could be the opportunity you have been searching for. All you need is your TRS-80 Model I, III, IV or 1000, your Apple or Commodore computer with or without disk drives, a minimum of 16K memory a reliable printer, and the desire to turn your micro into a highly profitable home business enterprise. For complete details, send $10.00 - (VISA,MASTER CARD and **AMERICAN EXPRESS** honored) to **Viking Inc.,** 910 Soo Blvd., Rice Lake, WI 54868. Asl for "OPPORTUNITY 85".

FREE PROGRAMS!!
TRS80-III/TRS80-4/TRS80-100/TRS80-200/TRS80-PC3/TRS80-MC10/TRS80-coco/IBMpc/Apple. Send stamps! **EZRAEZRA,** Box 5222-PRJA, San Diego, CA 92105.

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Handwriting Analyzer, Hangman, States And Capitals, Drawing Board, Free Information, **CTL Co.,** 115 Bixby Drive, Milpitas, California 95035. 8-78

Junkman Will Buy! I buy old scrap IC's, relays, circuit boards, diodes, any mixed junk, gold plated, transistors, connectors, dirty, broken, smashed or useless electronic junk - any amount! 1930 to 1985. Nothing refused! 10 years in business. Pack in boxes and ship UPS. Fast payment! **JUNKMAN,** 103 Saratoga St., Lawrence, Mass. 01842. 9-73

LETTER-WRITER DEMO SALE. Save 25% on the "A" rated word processor in Software Reports. We pay tax/USA shipping, MBG. Mod I, III/IV $23.99 tape, $37.99 disk. Orders: 1-800-622-4070; info/orders: 916-624-3709- **Astro-Star Enterprises,** 5905 Stone Hill Dr., #1, Rocklin, CA 95677. 5-73

LOAN AMORTIZATION SCHEDULE-Bank approved, satisfaction guaranteed. Model's I, III, 4, CC, and MSDOS computers. S.A.S.E. for sample printout and details. **COMPUTER SERVICES,** Rt. 3, Box 710, Homosassa, FL 32646. 1-75.

MODEL 4 EDITOR/ASSEMBLER CONVERSION. Convert the Mod I or Mod III R/S Series 1 disk EDTASM to operate in the Model 4 mode. Get the benefits of faster speed, 80x24 screen, memdisk, spool and more. Plus add the following enhancements not available with the R/S EDTASM: Copy/Move a block of text from one buffer locatoin to another. Alphabetic sort of symbol table; Cross reference listing of all symbols; Execute DOS commands from EDTASM such as DIR, REMOVE, COPY and many others. Disk and instruction manual, $19.95 plus $2 shipping and handling. Calif. residents add 6% sales tax. **High Desert Engineering,** 1630 So. Downs, Ridgecrest, CA 93555. 11-75

MailList - Mailing List Program for the TRS-80 Model III or 4 (model III mode) using TRSDOS 1.3. This program can handle an infinite number of data diskettes, each containing up to 750 addresses. It is menu driven and easy to use. Addresses may be added, deleted, corrected, printed, or sorted at any time. When printing the addresses, up to four at once may be on the screen; or, by using a printer, they may be printed on any size one or two across labels. Sorting of the addresses may be either alphabetically or by ZIP code. Included are a program diskette, data diskette, and full instruction manual. All that is required by the user is TRSDOS 1.3. Price - $17.50 each. **Maxwell Software Company,** 612 Pine Tree Road, Frederick, Oklahoma 73542.

Model 100/200 - Send for free catalog of compact affordable software. **CSA Software,** PO Box 22261, Chattanooga, TN 37422. 01-75

Model II Disk Drives: Expansion bays, 1 drive $175; 2 drives $225; 3 drives $285; 8 Meg primary $350; 8 Meg Secondary $300. **Computer Reset, 214-276-8072,** PO Box 461782, Garland, TX 75046.

★ ★ ★

PROBALOTO

The probability lottery program. Select numbers weighted towards the most or least picked or random, Pick 3&4 too. See review in the Oct. issue of Rainbow magazine on page 196. Versions for TRS-80 Color ecb, 16k tape and 32k disk, and Model 3&4 disk. Only $19.95, **Gary Olander,** 322 Haymarket Pl, Gahanna, OH. 43230. 1-74

PROFILE III PLUS KRUNCH
Gain disk space. Krunch moves records forward in file filling deleted records with active records and then shortens file to active record count. Use with floppy or hard disk version of Profile. On diskette with users guide $29.95. **ROY Schoeller,** 500 Northpointe Pkwy. #313, Jackson, MS 39211. Phone, **601-956-9798.** 2-77

PROGRAMS, PROGRAMS, PROGRAMS ONE catalog /month. $6.00 1 year refunded first order. Updates monthly. **JaRick SOFT,** P. O. Box 183, Fairmont, MN 56031. 1-75

SPELLBOUND! Improve your child's spelling! Practice school spelling lists on your home computer. Diskettes for Models III/4. $14.95pp from **ROBINSOFT,** Dept. C, Po Box 666, Prineville, OR 97754 or SASE for information.

TRS-80 COLOR COMPUTER video digitizer package includes machine language software, sample images, plans, documentation, and a high quality blank printed circuit board (predrilled & tinned). You supply the components (all available at Radio Shack for about $20) and an evening's time to construct. Uses composite standard NTSC video input source (VCR or video camera). a 7 grey level 256 x 192 pixiel (PMODE 4) image can be fully digitized in less than 3 seconds! The digitizer interfaces to and is totally powered by the joystick port and cassette I/O port. Control of brightness, contrast, and keyboard selection of 3, 5, or 7 grey levels is provided. Instructions permit disk image saving and re-display into a BASIC PMODE4 format allowing use with other commonly available graphic software. The software will work on any 16K or larger version of the Color Computer (32K min. for disk). Software and blank PC board is $39.95 plus $2.00 S&H. Please specify disk or tape version. SASE for information. **KINNEY SOFTWARE,** Dept CST, 121 N. Hampton Rd., Donnelsville, Ohio 45319.

TRS-80 Software, Models 1/3/4/4P, many useful programs, economical prices, Send $1 for listing: **Pratical Programs,** 1104 Aspen Drive, Toms River, NJ 08753. 12-76.

TRS-80 Software, Models 1/3/4/4P, many useful programs, economical prices, Send $1 for listing: **Pratical Programs,** 1104 Aspen Drive, Toms River, NJ 08753. 12-76.

The SEARCH is over. We find the TRS-80 software you're looking for, educational, business, games, what ever. **Westlakes Software Services,** Box 458038, Dept. CST1, San Antonio, TX 78280-8038. 1-73

$$$WIN with Thoroughbred, Harness, Greyhound. Handicapping Software ... $29.95, enhanced ... $49.95. Free information. **Software Exchange,** Box 5382, W. Bloomfield, MI 48033. **313-626-7208. 2-75.**

WORD PROCESSOR. BASIC Model 1, 3, 4 (3 mode) 16K, 32K, 48K, tape, disk. Full featured, with automatic wraparound, editing, formatting, global search/replace, form letter generation, set fonts, insert graphics. Includes 20-page manual. Specify your system. $10 tape, $12 disk, $15 compiled (48K M1 disk only). **D. Hinrichs,** 2116 SE 377th, Washougal, Washington 98671.

(104) TEXAS INSTRUMENTS COMPUTERS FOR SALE

★

Huge Inventory TI99/4A Hardware, software, accessories and printers. Free Catalog. **Competition Computer,** 2629 W. National, Milwaukee, Wisconsin 53204 **414-672-4010, 800-662-9253 nationwide, 800-242-7902 Wisconsin.** 2-78

Keyboard, joysticks, expansion box, disk drive, expanded memory, RS232, speech synthesizer, multiplan, Tlwriter, extended basic terminal emulator, Poker, Munch Man, Securities, Analysis, $300. **201-764-6886.** 1-74

TI99/4A, Computers $89. Expansion w/DSDD drive $339. Myarc cards, best prices MBX Voice Recognition $69. Printers from $179. All New. **Brian McGregor,** 1300 Suwanee, Daytona Beach, FL 32014. **PH. 904-258-0348.** 1-74.

(104A) TEXAS INSTRUMENTS COMPUTERS WANTED

Wanted: to buy. Used TI 810 printers. Call **Dave, 412-881-2590.** 1-73

(104B) TEXAS INSTRUMENTS SOFTWARE, PERIPH.

1985 Income Tax Filler. All forms (long and short) and most schedules for only $9.99 + $2.00 S&H. It recalculates on request for different values, optional form printing, etc. Disk or cassette. **DATAX Co.,** 1923 Linden St., Ridgewood, NY 11385. 718-417-0165

ADD 8K of USER RAM to EDITOR ASSEMBLER module! Has hundreds of uses, cheap and easy to do. $10 for detailed instructions. **Eric Benton,** 45 Elm Street, Apt. #7, Waterville, Maine 04901. 11-74

FREE PROGRAMS!!
TI99-4A/IBMpc's/TRS80's/Timexes/Apples/Adam/Commodores. Send stamps! **EZRAEZRA,** Box 5222PTJA, San Diego, CA 92105.

FREE SOFTWARE! Over 4000 99/4A Public Domain programs, available from the Free Access Library. Free help for 99/4A owners from the non-profit Helpline. Send SASE to: **Amnion Helpline,** 116 Carl Street, San Francisco, CA 94117 for information or call **415-753-5581,** 9am-4pm (Pacific time), Mon.-Sat. Giving free help to 99/4A owners since March, 1981. 1-74

FREEWARE- Elementary grades. Handles gradebook calculations for lists of elementary students. Great aid-simple to use. Req: Disk, memory, X-Basic, printer optional. Pay $10.00 if you like it. Send disk and return postage or $3.00 for disk, packing and mailing to: **W. Coughenour,** 121 W. Highway 60, Republic, MO 65738. 2-74.

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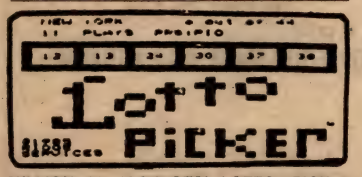

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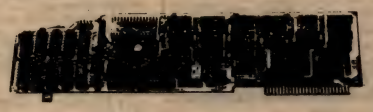

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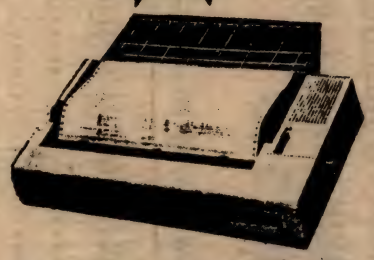

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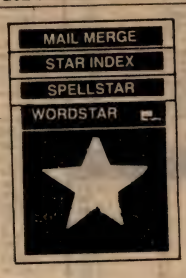

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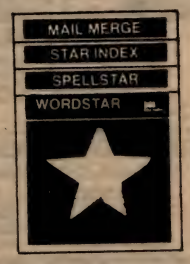

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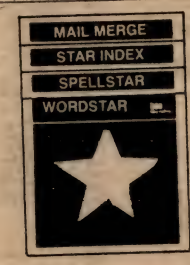

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SN7474N	14	.35
SN7475N	16	.39
SN7476N	16	.35
SN7479N	24	4.95
SN7480N	14	.59
SN7482N	16	.95
SN7483N	16	.49
SN7485N	16	.55
SN7486N	14	.35
SN7489N	16	1.95
SN7490N	14	.39
SN7491N	14	.69
SN7492N	14	.49
SN7493N	14	.35
SN7494N	14	.89
SN7495N	14	.49
SN7496N	16	.65
SN74H71N	14	2.69
SN74100N	24	1.75
SN74105N	14	.59
SN74107N	14	.19
SN74109N	16	.39
SN74116N	24	1.49
SN74121N	14	.29
SN74122N	14	.45
SN74123N	16	.49
SN74125N	14	.45
SN74126N	14	.49
SN74128N	14	.49
SN74132N	14	.49
SN74136N	14	.69
SN74141N	16	.89
SN74142N	16	2.95
SN74143N	24	3.95
SN74144N	24	2.95
SN74145N	16	.65
SN74147N	16	1.69
SN74148N	16	.89
SN74150N	24	1.29
SN74151N	16	.29
SN74152N	14	.49
SN74153N	16	.39
SN74154N	24	1.25
SN74155N	16	.49
SN74156N	16	.65
SN74157N	16	.49
SN74158N	16	1.39
SN74159N	24	1.49
SN74160N	16	.79
SN74161N	16	.59
SN74162N	16	.85
SN74163N	16	.59
SN74164N	14	.69
SN74165N	16	.69
SN74166N	16	.69
SN74167N	16	2.95
SN74170N	16	1.59
SN74172N	24	4.95
SN74173N	16	.75
SN74174N	16	.59
SN74175N	16	.59
SN74176N	14	.89
SN74177N	14	.89
SN74179N	16	1.49
SN74180N	14	.69
SN74181N	24	1.95
SN74182N	16	.75
SN74184N	16	1.95
SN74185N	16	1.95
SN74189N	16	1.95
SN74190N	16	.89
SN74191N	16	.89
SN74192N	16	.69
SN74193N	16	.69
SN74194N	16	.79
SN74195N	16	.79
SN74196N	14	.99
SN74197N	14	.89
SN74198N	24	1.35
SN74199N	24	1.35
SN74221N	16	.89
SN74251N	16	.89
SN74273N	20	1.95
SN74276N	28	2.49
SN74279N	16	.59
SN74283N	16	1.39
SN74284N	28	2.95
SN74285N	16	2.95
SN74365N	16	.59
SN74366N	16	.59
SN74367N	16	.59
SN74368N	16	.59
SN74390N	16	1.49
SN74393N	14	1.49

74LS

Part No.	Pins	Price
74LS00	14	.19
74LS01	14	.19
74LS02	14	.19
74LS03	14	.19
74LS04	14	.25
74LS05	14	.25
74LS06	14	.99
74LS07	14	.99
74LS08	14	.19
74LS09	14	.19
74LS10	14	.19
74LS11	14	.19
74LS12	14	.19
74LS14	14	.39
74LS15	14	.29
74LS20	14	.19
74LS21	14	.25
74LS26	14	.25
74LS27	14	.25
74LS28	14	.29
74LS30	14	.19
74LS32	14	.25
74LS33	14	.39
74LS37	14	.29
74LS38	14	.29
74LS42	16	.65
74LS47	16	.89
74LS48	16	.89
74LS51	14	.25
74LS54	14	.19
74LS73	14	.35
74LS74	14	.25
74LS75	16	.29
74LS76	16	.29
74LS85	16	.49
74LS86	14	.25
74LS90	14	.39
74LS92	14	.49
74LS93	14	.39
74LS96	16	.49
74LS107	16	.35
74LS109	16	.35
74LS112	16	.29
74LS122	14	.45
74LS123	16	.49
74LS125	14	.39
74LS126	14	.39
74LS132	14	.39
74LS133	16	.49
74LS136	14	.39
74LS138	16	.39
74LS139	16	.39
74LS145	16	.89
74LS147	16	.99
74LS148	16	.99
74LS151	16	.39
74LS153	16	.39
74LS154	24	1.49
74LS155	16	.49
74LS156	16	.49
74LS157	16	.35
74LS158	16	.35
74LS160	16	.69
74LS161	16	.39
74LS162	16	.69
74LS163	16	.49
74LS164	14	.49
74LS165	16	.79
74LS166	16	.89
74LS168	16	.99
74LS169	16	.99
74LS170	16	1.49
74LS173	16	.49
74LS174	16	.39
74LS175	16	.39
74LS181	24	1.49
74LS189	16	3.95
74LS190	16	.49
74LS191	16	.49
74LS192	16	.69
74LS193	16	.69
74LS194	16	.59
74LS195	16	.59
74LS196	14	.89
74LS197	14	.89
74LS221	16	.59
74LS240	20	.69
74LS241	20	.69
74LS242	14	1.09
74LS243	14	.69
74LS244	20	.69
74LS245	20	.79
74LS247	16	.99
74LS251	16	.49
74LS253	16	.49
74LS257	16	.39
74LS258	16	.49
74LS259	16	1.19
74LS260	14	.49
74LS261	16	1.49
74LS266	14	.49
74LS273	20	.79
74LS279	16	.39
74LS280	14	1.19
74LS283	16	.59
74LS289	16	3.95
74LS299	20	1.49
74LS322	20	2.95
74LS323	20	2.49
74LS347	16	.79
74LS353	16	1.19
74LS364	20	1.95
74LS365	16	.39
74LS366	16	.39
74LS367	16	.39
74LS373	20	.79
74LS374	20	.79
74LS377	20	.79
74LS386	14	.45
74LS390	16	1.09
74LS393	14	.79
74LS399	16	1.09
74LS490	16	1.49

74S/PROMS*

Part No.	Pins	Price
74S00	14	.29
74S02	14	.29
74S04	14	.35
74S05	14	.35
74S08	14	.35
74S09	14	.39
74S10	14	.29
74S11	14	.35
74S15	14	.35
74S20	14	.35
74S22	14	.35
74S30	14	.35
74S32	14	.35
74S37	14	.69
74S38	14	.69
74S64	14	.39
74S65	14	.39
74S74	14	.49
74S85	16	1.49
74S86	14	.35
74S112	16	.49
74S124	16	2.75
74S132	14	1.49
74S133	16	.45
74S135	16	.89
74S136	14	1.39
74S138	16	.79
74S139	16	.79
74S140	14	.55
74S151	16	.79
74S153	16	.79
74S157	16	.79
74S158	16	.89
74S160	16	4.95
74S169	16	3.95
74S174	16	.79
74S175	16	.79
74S188*	16	1.75
74S189	16	1.95
74S194	16	1.49
74S195	16	1.49
74S240	20	1.49
74S241	20	1.49
74S242	14	2.69
74S244	20	1.49
74S251	16	.79
74S253	16	.79
74S257	16	.79
74S258	16	.99
74S273	20	2.39
74S280	14	1.89
74S287*	16	1.69
74S288*	16	1.69
74S299	20	3.95
74S373	20	1.69
74S374	20	1.69
74S472*	20	3.49

74ALS

Part No.	Pins	Price
74ALS00	14	.35
74ALS02	14	.35
74ALS04	14	.39
74ALS05	14	.39
74ALS08	14	.35
74ALS10	14	.35
74ALS27	14	.39
74ALS30	14	.35
74ALS32	14	.39
74ALS74	14	.55
74ALS109	16	.55
74ALS112	16	.79
74ALS138	16	.89
74ALS174	16	.89
74ALS175	16	.89
74ALS240	20	1.79
74ALS244	20	1.79
74ALS245	20	2.49
74ALS373	20	1.95
74ALS374	20	1.95
74ALS573	20	1.95

74F

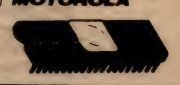
Part No.	Pins	Price
74F00	14	.59
74F02	14	.59
74F04	14	.65
74F08	14	.59
74F10	14	.59
74F32	14	.65
74F74	14	.69
74F86	14	.89
74F109	16	.89
74F138	16	1.19
74F139	16	1.29
74F157	16	1.29
74F158	16	1.29
74F193	16	4.95
74F240	20	2.49
74F241	20	2.49
74F244	20	2.49
74F251	16	1.49
74F253	16	1.79
74F257	16	1.39
74F373	20	2.95
74F374	20	2.95
74F379	16	2.19

CD—CMOS

Part No.	Pins	Price
CD4000	14	.19
CD4001	14	.19
CD4002	14	.25
CD4006	14	.69
CD4007	14	.25
CD4008	16	.89
CD4009	16	.39
CD4010	16	.39
CD4011	14	.19
CD4012	14	.25
CD4013	14	.35
CD4014	16	.69
CD4015	16	.25
CD4016	14	.29
CD4017	16	.49
CD4018	16	.69
CD4019	16	.35
CD4020	16	.59
CD4021	16	.69
CD4022	16	.69
CD4023	14	.25
CD4024	14	.49
CD4025	14	.25
CD4026	16	1.49
CD4027	16	.39
CD4028	16	.65
CD4029	16	.65
CD4030	14	.39
CD4034	24	1.39
CD4035	16	.85
CD4040	16	.65
CD4041	14	.75
CD4042	16	.59
CD40103	16	2.95
CD4503	16	.49
CD4508	24	1.45
CD4510	16	.69
CD4511	16	.69
CD4512	16	.69
CD4514	24	.99
CD4515	24	1.39
CD4516	16	.79
CD4518	16	.79
CD4519	16	.39
CD4520	16	.79
CD4522	16	.79
CD4526	16	.79
CD4528	16	.79
CD4529	16	1.49
CD4531	16	.89
CD4538	16	.89
CD4541	14	.89
CD4543	16	.99
CD4553	16	4.95
CD4555	16	.89
CD4556	16	.89
CD4560	16	3.95
CD4566	16	1.95
CD4583	16	1.19
CD4584	14	.59
CD4585	16	.75
CD4723	16	1.19
CD4724	16	1.19
MC14411	24	9.95
MC14490P	16	4.49
MC14572	16	.89

SPECIAL!! SPECIAL!! SPECIAL!!

MOTOROLA



MC68701 — Microcomputer with EPROM

The MC68701 is an 8-bit single chip microcomputer unit (MCU) which significantly enhances the capabilities of the MC6800 family of parts. On-chip resources include 2048 bytes of EPROM, 128 bytes of RAM, Serial Communications Interface (SCI), parallel I/O, and a three function Programmable Timer.

MC68701 . . . . . $24.95

CUSTOM COMMODORE CHIPS for VIC-20, C-64 and C-128 Personal Computers

Part No.	Description	Price
*6510	CPU	$19.95
*6525	TPI	$20.95
*6526	CIA	$25.95
*6560	VIC-I	$29.95
*6567	VIC-II	$44.95
*6581	SID	$32.95
82S100PLA	PLA	$37.95

*SPECS. AVAILABLE @ $1.50 EA.

NOTE: 82S100 = U17 (C-64)

MICROPROCESSOR COMPONENTS

MICROPROCESSOR CHIPS

Part No.	Pins	Function	Price
D765AC	40	Floppy Disk Controller	4.95
CDP1802CE	40	CPU 2.5MHz	9.95
2661-3	28	Enhanced Prog. Comm. Interface	6.95
D3242	28	Addr. Multiplexer & Refresh Counter	6.95

Z80, Z80A, Z80B, SERIES

Z80	40	CPU (MK3880N)(780C)2.5MHz	1.75
Z80-CTC	28	Counter Timer Circuit	1.79
Z80-DART	40	Dual Asynchronous Rec./Trans.	4.95
Z80-DMA	40	Direct Memory Access Circuit	4.95
Z80-PIO	40	Parallel I/O Interface Controller	1.79
Z80-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	4.95
Z80-S10/1	40	Serial I/O (Lacks DTRB)	4.95
Z80-S10/2	40	Serial I/O (Lacks SYNCB)	4.95
Z80-S10/9	40	Serial I/O	4.95
Z80A	40	CPU(MK3880N-4)(780C-1)4MHz	1.85
Z80A-CTC	28	Counter Timer Circuit	1.89
Z80A-DART	40	Dual Asynchronous Rec./Trans.	5.25
Z80A-DMA	40	Direct Memory Access Circuit	5.95
Z80A-P10	40	Parallel I/O Interface Controller	1.95
Z80A-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	5.25
Z80A-S10/1	40	Serial I/O (Lacks DTRB)	5.25
Z80A-S10/2	40	Serial I/O (Lacks SYNCB)	5.25
Z80A-S10/9	40	Serial I/O	5.25
Z80B	40	CPU (MK3880N-6) 6MHz	3.95
Z80B-CTC	28	Counter Timer Circuit	4.95
Z80B-DART	40	Dual Asynchronous Rec./Trans.	6.95
Z80B-P10	40	Parallel I/O Interface Controller	4.95
Z80B-SIO/0	40	Ser.I/O (TxCB & RxCB Bond.) (MK3884-6)	12.96
Z80B-SIO/1	40	Serial I/O (Lacks DTRB)	12.85
Z80B-SIO/2	40	Serial I/O (Lacks SYNCB)	12.79

6500/6800/68000 SERIES

6502	40	MPU with Clock (1MHz)	2.75
6502A	40	MPU with Clock (2MHz)	2.95
6502B	40	MPU with Clock (3MHz)	6.95
6520	40	Peripheral Inter. Adapter	2.95
6522	40	Versatile Inter. Adapter	4.95
6532	40	RAM I/O, Timer Array	6.49
6545	40	CRT Controller (CRTC)	4.95
6551	28	Async. Comm. Interface Adapt.	6.95
6800	40	MPU	1.95
6802	40	MPU with Clock and RAM	4.95
6809	40	CPU — 8-Bit (On-Chip Oscillator)	5.75
6809E	40	CPU — 8-Bit (External Clocking)	5.95
6810	24	128x8 Static RAM	1.95
68B10	24	128x8 Static RAM (2MHz)	3.49
6821	40	Peripheral Inter.Adapt.(MC6820)	1.95
68B21	40	Peripheral Interface Adapter (2MHz)	3.95
6840	28	Programmable Timer	6.75
6843	40	Programmable Floppy Disk Controller	19.95
6845	40	CRT Controller (CRTC)	4.95
68B45	40	CRT Controller (CRTC) 2MHz	6.95
6850	24	Asynchronous Comm. Adapter	1.95
6852	24	Synchronous Serial Data Adapter	4.75
6860	24	0-600bps Digital MODEM	7.95
68000L8	64	MPU 16-Bit (8MHz)	9.95
68488P	40	General Purpose Int. Adapter	14.95
68661	28	Enhanced Prog. Comm. Interface (2661)	8.95
68701	40	Microcomputer with EPROM	24.95

8000/80000 SERIES

8031	40	Control Oriented CPU w/RAM & I/O	6.95
80C31BH	40	CPU with RAM and I/O (CMOS)	19.95
8035	40	MPU — 8-Bit	1.95
8039	40	CPU—Sgl. Chip 8-Bit (128bts. RAM)	2.75
8060	40	CPU — 8-Bit NMOS	14.95
8073N	40	CPU w/Basic Micro Interpreter	29.95
8080A	40	CPU	3.95
8085A	40	CPU	2.75
8085A-2	40	CPU-8-Bit N-Channel(5MHz)	6.95
8086-2	40	CPU 16-bit 8MHz	8.95
8087	40	Arithmetic Processor (5MHz)	129.95
8087-2	40	Arithmetic Processor (8MHz)	139.95
8088	40	CPU 8/16-Bit	7.95
8116	16	Dual Baud Rate Generator	8.95
8155	40	HMOS RAM I/O Port-Timer	2.75
8156	40	RAM with I/O Port and Timer	2.75
8202	40	Dynamic RAM Controller	9.95
8203	40	64K Dynamic RAM Controller	29.95
8205	16	Hi Speed 1 out of 8 Binary Decoder	3.29
8212	24	8-Bit Input/Output (74S412)	1.95
8224	16	Clock Generator/Driver	2.25
8228	28	Sys. Cont./Bus Driver (74S428)	3.49
8237-5	40	High Perf. Prog. DMA Cont. (5MHz)	6.95
8238	28	System Controller (74S438)	4.29
8243	24	I/O Expander for 48 Series	2.49
8250A	40	Async. Comm. Element	6.95
8250B	40	ACE (IBM PC or XT Software Compatible)	5.95
8251	28	Prog. Comm. I/O (USART)	1.95
8251A	28	Prog. Comm. Interface (USART)	2.25
8253-5	24	Programmable Interval Timer	2.25
8254	24	Programmable Interval Timer	9.95
8255	40	Prog. Peripheral I/O (PPI)	1.95
8255A-5	40	Prog. Peripheral I/O (PPI) 5MHz	2.25
8257-5	40	Prog. DMA Controller	2.49
8259-5	28	Prog. Interrupt Controller	2.49
8272	40	Sgle/Dble Density Floppy Disk Cont.	4.95
8274	40	Multi-Protocol Serial Cont. (7201)	14.95
8275	40	Prog. CRT Controller	14.95
8279	40	Prog. Keyboard/Display Interface	2.49
8279-5	40	Prog. Keyboard/Display Interface	2.95
8282	20	Octal Latch	1.95
8284	18	Clock Generator/Driver	2.95
8286	20	Octal Bus Transceiver	3.95
8287	20	Octal Bus. Transceiver (Inverted)	3.95
8288	20	Bus Controller	4.95
8289	20	Bus Arbiter	14.95
8741	40	8-Bit Univ. Peripheral Interface	8.95
8748	40	HMOS EPROM MPU	7.95
8749	40	MPU 8-Bit (EPROM Version of 8049)	9.95
87511	40	CPU w/4Kx8 EPROM & 128x8 RAM	29.95
8755	40	16K EPROM with I/O	14.95
80186	68	High Integration 16-Bit MPU	49.95
80188	68	High Integra. 16-Bit MPU (8-Bit Data Bus)	49.95
80287	40	Numeric Processor Ext.	229.95

DYNAMIC RAMS

Part No.	Pins	Function	Price
1103	18	1024x1 (300ns)	.69
4027	16	4096x1 (250ns)	.89
4116N-15	16	16,384x1 (150ns)	.45
4116N-20	16	16,384x1 (200ns)	.39
4128	18	131,072x1 (200ns)	4.95
4164N-150	16	65,536x1 (150ns)	.89
4164N-200	16	65,536x1 (200ns)	.79
TMS4416-12	18	16,384x4 (120ns)	4.95
MM5261	18	1024x1 (300ns)	.25
MM5262	22	2048x1 (365ns)	.25
MM5270	18	4096x1 (250ns)	1.95
MM5280	22	4096x1 (200ns) 2107	1.95
MM5298-3	16	8192x1 (200ns)	.19
8118	16	16,384x1 (120ns)(+5V Only Req.)	1.95
41256-150	16	262,144x1 (150ns)	3.29
41256-200	16	262,144x1 (200ns)	3.19
50464-15	18	65,536x4 (150ns)(41254)(41464)	7.95

STATIC RAMS

Part No.	Pins	Function	Price
TMM2016-12	24	2048x8 (120ns)	1.69
2101	22	256x4 (450ns) 8101	1.95
2102	16	1024x1 (350ns)	.89
2102-2L	16	1024x1 (250ns) L.P. (91L02)	1.49
2111	18	256x4 (450ns) 8111	2.49
2112	18	256x4 (450ns) MOS	2.49
2114N	18	1024x4 (450ns)	.99
2114N-L	18	1024x4 (450ns) L.P.	1.09
2114N-2	18	1024x4 (200ns)	1.05
2114N-2L	18	1024x4 (200ns) L.P.	1.49
21C14	18	1024x4 (200ns) (CMOS)	.49
2116N-25L	24	2048x8 (250ns) L.P. NMOS	3.49
2125A	16	1024x1 (45ns) High Speed	2.95
2147HN	18	4096x1 (70ns)	3.95
2148HN	18	1024x4 (70ns)	4.29
2149	18	1024x4 (45ns)	4.95
27LS00	16	256x1 (80ns) L.P.	2.95
TMS40L47-45	20	1024x4 (450ns)	.99
5101	22	256x4 (450ns) CMOS	3.95
MM5257	18	4096x1 (450ns) 4044	2.95
HM6116P-3	24	2048x8 (150ns) CMOS	1.79
HM6116LP-3	24	2048x8 (150ns) L.P. CMOS	1.85
HM6116P-4	24	2048x8 (200ns) CMOS	1.69
HM6116LP-4	24	2048x8 (200ns) L.P. CMOS	1.75
HM6264P-12	28	8192x8 (120ns) CMOS	4.69
HM6264LP-12	28	8192x8 (120ns) L.P. CMOS	4.79
HM6264P-15	28	8192x8 (150ns) CMOS	4.49
HM6264LP-15	28	8192x8 (150ns) L.P. CMOS	4.59
6514	18	1024x4 (350ns)CMOS(UPD444C)	4.49
74S189	16	16x4 (35ns)	1.95
74S289	16	16x4 (35ns) 3101	2.95

PROMS/EPROMS

1702A	24	256x8 (1µs)	3.95
TMS2516	24	2048x8 (450ns)	3.49
TMS2532	24	4096x8 (450ns) NMC2532	3.95
TMS2564	28	8192x8 (450ns)	8.95
2708	24	1024x8 (450ns)	3.95
TMS2716	24	2048x8 (450ns) 3 voltage	6.49
2716	24	2048x8 (450ns)	2.49
27C16	24	2048x8 CMOS	9.95
2716-1	24	2048x8 (350ns)	2.95
2732	24	4096x8 (450ns)	2.49
2732A-20	24	4096x8 (200ns) 21V	3.95
2732A-25	24	4096x8 (250ns) 21V	2.95
2732A-45	24	4096x8 (450ns) 21V	2.75
27C32	24	4096x8 CMOS	10.95
2758	24	1024x8 (450ns) Single +5V	3.95
2764-20	28	8192x8 (200ns) 21V	3.95
2764-25	28	8192x8 (250ns) 21V	2.95
2764A-25	28	8192x8 (250ns) 12.5V	2.95
2764-45	28	8192x8 (450ns) 21V	2.19
27C64	28	8192x8 CMOS 21V	6.95
27128-25	28	16,384x8 (250ns) 128K 21V	2.95
27128A-25	28	16,384x8 (250ns) 128K 12.5V	4.95
27256-25	28	32,768x8 (250ns) 256K (14V)	7.95
27C256-25	28	32,768x8 (250ns) 256K (CMOS)	13.95
68764	24	8192x8 (450ns) 25V	15.95
68766	24	8192x8 (350ns) 25V	16.95
74S188	16	32x8 PROM O.C. (6330-1)	1.75
74S287	16	256x4 PROM T.S. (6301-1)	1.69
74S288	16	32x8 PROM T.S. (6331-1)	1.69
74S387	16	256x4 PROM O.C. (6300-1)	1.69
74S471	28	256x8 PROM T.S. (6309-1)	4.95
74S472	28	512x8 PROM T.S. (6349-1)	3.49
74S473	28	512x8 PROM O.C. (6348)	2.95
74S474	24	512x8 PROM T.S. (DM87S296N)	3.49
74S475	24	512x8 PROM O.C. (6340)	3.49
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74S571	16	512x4 PROM T.S. (6306)	2.95
74S572	16	1024x4 PROM O.C. (6352)	3.49
74S573	16	1024x4 PROM T.S. (82S137)	2.95
82S23	16	32x8 PROM O.C. (27S18)	2.95
82S115	24	512x8 PROM T.S. (27S15)	9.95
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82S126	16	256x4 PROM O.C. (27S20)	2.95
82S129	16	256x4 PROM T.S. (27S21)	2.95
82S130	16	512x4 PROM O.C. (27S12)	3.95
82S185	24	2048x4 PROM T.S. (TBP24S81)	9.95
82S191	24	2048x8 (80ns)	14.95
DM87S181N	24	1024x8 PROM T.S. (82S181)	9.95

DATA ACQUISITION

ADC0800	18	8-Bit A/D Converter (±1 LSB)	14.49
ADC0801	20	8-Bit A/D Converter (1/4LSB)	14.95
ADC0803	20	8-Bit A/D Converter (±1/2LSB)	5.95
ADC0804	20	8-Bit A/D Converter (1LSB)	3.49
ADC0808	28	8-Bit A/D Conv w/8-Channel Analog	3.95
ADC0809	28	8-Bit A/D Converter (8-Ch. Multi.)	3.95
ADC0816	40	8-Bit A/D Conv w/16-Channel Analog	14.95
ADC0817	28	8-Bit A/D Converter (16-Ch. Multi.)	8.95
ADC0832	8	8-Bit Ser. I/O A/D Conv (2-ch. or 8-Ch. Mult.)	4.95
DAC0800	16	8-Bit D/A Converter (±1 LSB)	3.95
DAC0806	16	8-Bit D/A Converter (0.78% Lin.)	1.95
DAC0807	16	8-Bit D/A Converter (MC1408-7)	1.49
DAC0808	16	8-Bit D/A Converter (MC1408-8)	1.95
DAC0830	20	8-Bit Up D/A Conv. (.05% Lin.)	5.95
DAC0831	20	8-Bit Up D/A Conv. (.10% Lin.)	3.95
DAC1000	24	10-Bit D/A Conv. Micro. Comp. (0.05%)	4.95
DAC1008	28	8-

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RS232 Adapter for VIC-20 and Commodore 64

The JE232CM allows connection of standard serial RS232 printers, modems, etc. to your VIC-20 and C-64. A 4-pole switch allows the inversion of the 4 control lines. Complete installation and operation instructions included.

• Plugs into User Port • Provides Standard RS232 signal levels • Uses 6 signals (Transmit, Receive, Clear to Send, Request to Send, Data Terminal Ready, Data Set Ready).

JE232CM $39.95

VOICE SYNTHESIZER FOR COMMODORE VIC-20 AND C-64
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JE520CM. $99.95

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Mitey-Mo **(For C-64). $74.95**

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FREE 4K Buffer Included!
MW350 (For VIC-20, C-64 & C-128) $69.95

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EXPAND TRS-80 MEMORY

TRS-80 MODEL I, III

Each Kit comes complete with eight MM5290 (UPD416/4116) 16K Dynamic RAMs and documentation for conversion. Model I: 16K equipped with Expansion Interface can be expanded to 48K with 2 Kits. Model III: Can be expanded from 16K to 48K using 2 Kits. Each Kit will expand computer by 16K increments.

TRS-16K3 200ns (Model III). $5.95
TRS-16K4 250ns (Model I). $5.49

TRS-80 COLOR AND COLOR II

Easy to install Kit comes complete with 8 each 4164N-20 (200ns) 64K Dynamic RAMs and documentation for conversion. Converts TRS-80 Color Computers with D, E, ET, F and NC circuit boards to 32K. Also converts TRS-80 Color Computer II to 64K. Flex DOS or OS-9 required to utilize full 64K RAM on all computers.

TRS-64K-2. . . . . $9.95

TRS-80 MODEL 4, 4P

Easy to install Kits come complete with: TRS-64K-2 (8 ea. 4164N-20 (200ns) 64K Dynamic RAMs); TRS-64K-2PAL (8 ea. 4164's plus PAL chip) and documentation for conversion.

TRS-64K-2 Expands Model 4 from 16K-64K or Model 4P from 64K-128K. . . . . $ 9.95
TRS-64K-2PAL Expands Model 4 from 64K to 128K. . . . $29.95

• TRS-80 Model 100 • NEC • Olivetti

Easy to install Module plugs right into the socket increasing memory in 8K increments. Three modules will increase your memory to its full capacity. Complete with module and documentation for installation.

M1008K (TRS-80 Model 100 Expansion). . . . . $29.95 ea. or 3/$79.95
NEC8KR (NEC PC-8201A). . . . . $29.95 ea. or 3/$79.95
OM108K (Olivetti M10). . . . . $29.95 ea. or 3/$79.95

TANDY 200

Easy to install module plugs right into the socket increasing memory in 24K increments. Complete with module and documentation for installation.

M200R (Tandy 200 Expansion). . . $99.95 ea. or 2/$189.95

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Intelligent 1200/300 Baud Modem with Real Time Clock/Calendar

The ProModem™ is a Bell 212A (1200/300) intelligent stand-alone modem • Hayes command set compatible plus an additional extended command set • Shown with alphanumeric display option.

PM1200 RS-232 Stand-Alone Unit. $299.95

OPTIONS FOR ProModem 1200

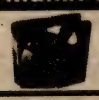
PM-COM (ProCom Communication Software). . . . . $ 79.95
Please specify Operating System — Apple ProDOS or CP/M — or IBM PC DOS or MS DOS
PM-OP512K (Communication Buffer Option). $129.95
BUF512K (512K Memory for PM-OP512K) . . . . . $ 54.95
PM-ALP (Alphanumeric Display). . . . . $ 79.95

PM-Special #2 (Includes PM-OP512K, BUF512K and PM-ALP). $249.95

The ProModem 1200B/BS is a 1200/300 baud modem card which plugs into IBM PC and XT. Provides a third serial Comport. Two versions available: 1200B (without software) and 1200BS (with software). The PM1200BS is supplied with powerful MITE communications software from Mycroft Labs. Software available: PC DOS or MS DOS.

PM1200B (without Software). $239.95
PM1200BS (with MITE Software). $274.95

Muffin-Style & Sprite-Style Fans



MUF60 (SPN3-15-2462)
Howard Industries (4.68"sq.,60cfm). . . . $9.95

SU2C7
EG&G Rotron (3.125" sq., 20 cfm) $9.95

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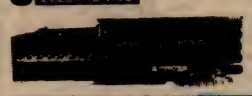
Five Key Software Programs!

128K RAM Card For Apple II, II+ and *IIe** *RAM Disk!*



The **JE868** is functionally compatible with the Apple II language card and can be utilized with all software that can be used with a standard 16K card. The JE868 requires no modifications to your Apple computer. Five key software programs are included: Memory Management System, utilities, diagnostics, demos, and RAM disk emulators for DOS 3.3, CP/M and Apple Pascal. Also features DOS relocator. Complete w/instructions. (Note: CP/M - Versions 2.2 or earlier — PASCAL - Versions 1.1 or earlier)

JE868 (Expand-A-RAM). $119.95

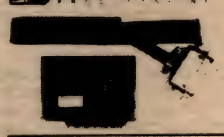
PROMETHEUS

Applesurance Diagnostic Disk Controller Card For Apple II, II+ and *IIe** *Prevents Crashes!*

The **JE877** serves as a diagnostic tool, an assurance/maintenance tool and a dual disk drive controller. The JE877 will verify and check the operating hardware of your system each time you turn on your Apple II, II+ or *IIe*.* Test your RAM, ROM, CPU, and disk drives. Diagnostic routines may be cancelled at the touch of a key. Complete with instructions.

JE877 (DRV-1/Applesurance II). $69.95

PROMETHEUS



Parallel Printer Card For Apple II, II+ and *IIe**

The **JE880** Printer Interface board is an intelligent interface to most of today's popular dot-matrix graphics printers. The JE880 is fully compatible with Apple CP/M, Apple Pascal (or FORTRAN), and most other operating systems and software packages available for Apple II, II+ and *IIe*.* The JE880 is shipped configured for the Centronics standard and can be re-configured for other standards if necessary. Advanced text printing features include: video screen echo ON or OFF, auto/disable linefeed after carriage return, set/clear the 8th bit of the output data, set left margin and more! Complete with instructions.

JE880 (PRT-1). $59.95

PROMETHEUS

Parallel/Serial Buffer Card For Apple II, II+ and *IIe**

The **JE883** provides the user with up to 64K of additional or buffered memory (18 pages of information). Using the parallel jumper cable supplied, the JE883 will attach to the JE880 (above) Parallel Card needed for operation. The JE883 includes a standard parallel input with both parallel and serial (RS232) buffered outputs. With these features you may access and buffer information to two types of printers (one serial, one parallel) simultaneously. Complete with instructions.

JE883 (P/S Buffer). $79.95

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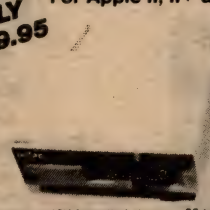
ONLY $129.95



• Direct drive • 143K formatted storage • 35 tracks • Super quiet • Works with Apple Controllers or other compatibles (JE875) (right) • Complete with connector — just plug into your controller • Size: 5¾"W x 1⅝"H x 8"D • Weight: 4 lbs.

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ADD-514 (Disk Drive). $139.95
JE875 (Controller Card). . . . . $ 49.95

APPLE™ *IIc* Compatible 5¼" Half-Height Disk Drive

Same specs as ADD-12 except no controller nece

ADD-IIc. . . . . $12[illegible]

Additional Apple* Compatible Products

Key: a = Apple II or II+ b = Apple *IIe*

APF-1	Cooling Fan with surge protection • Key: (a,b).	$ 39.95
KHP4007	Switching Power Supply • Key: (a,b).	$ 39.95
JE614	Numeric/Aux. Keypad — 11 accessible functions • Key: (b).	$ 49.95
JE860	16K RAM Card (Note: CP/M Versions 2.2 or earlier) • Key: (a). . . .	$ 39.95
JE864	80-Column plus 64K RAM • Key: (b).	$ 69.95
AMON	12" Green Monitor with swivel stand • Key: (a, b & *IIc*).	$ 99.95
KB-EA1	Apple Keyboard and Case • Key: (a).	$ 99.95
JE520AP	Voice Synthesizer — Plug-in, User Ready • Key: (a,b).	$119.95
PM1200A	Prometheus Internal Modem — 2 cards • Key: (a,b).	$299.95
PM1200M	Prometheus MacIntosh Ext. Modem • Key: (Macintosh).	$349.95

General Application Power Supplies

Power/Mate Corp. REGULATED POWER SUPPLY

• Input: 105-125/210-250VAC @ 47-63Hz • Line regulation: ±0.05% • Three mounting surfaces • Overvoltage protection • UL recognized • CSA certified

Part No.	Output	Size	Weight	Price
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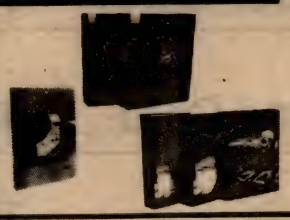
EMA5/6C	5V@6A/6V@5A	5⅝"Lx4⅞"Wx2⅞"H	4lbs.	$39.95

4-CHANNEL SWITCHING POWER SUPPLY

• Microprocessor, mini-computer, terminal, medical equipment and process control applications • Input: 90-130VAC, 47-440Hz • Output: +5VDC @ 5A, −5VDC @ 1A; +12VDC @ 1A, −12VDC @ 1A • Line regulations: ±0.2% • Ripple: 30mV p-p • Load regulation: ±1% • Overcurrent protection • Adj: 5V main output ±10% • Size: 6⅜"L x 1⅞"W x 4-15/16"H • Weight: 1½ lbs.

FCS-604A. $59.95

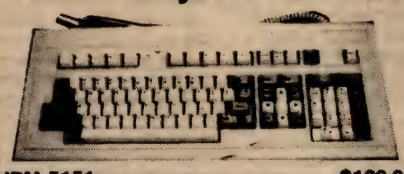
DATA BOOKS



30009	**Intersil Data Book (1985).** Complete Line (1075 pages).	$9.95
30013	**Zilog Data Book (1985).** Microprocessors and Support Chips (1045 pages).	$9.95
210830	**Intel Memory Components Hndbk. (1983/84).** Contains all Applications Notes, Article Reprints, Data Sheets & other design information on Intel's RAMs, DRAMs, EPROMs, EPROMs and Bubble Memories (880 pages).	$14.95
230843	**Intel Microsystem Components Hndbk. (1983/84)** Contains Data Sheets on all of Intel's Microprocessors & peripherals — 2 volumes (2575 pages).	$19.95
30022	**National Logic Data Book Set (1984).** Volumes I & II (3485 pages). Contains information on National's TTL product line and CD4000 family. This includes 7400, 74L, S, AS, LS and ALS Series devices, and MM54HC / 74HC / 54HCT / 74HCT High Speed Micro CMOS family, MM54C / 74C family, and CMOS LSI / VLSI.	$24.95

IBM Accessories

IBM PC/XT Compatible Keyboard



IBM-5151 (Equivalent to Keytronics™ 5151). . . . $129.95

Additional Add-Ons Available!

IBM-Case	Computer Case.	$ 59.95
IBM-KB	Keyboard.	$ 79.95
IBM-FCC	Disk Controller.	$ 79.95
IBM-MCC	Monochrome Card.	$ 99.95
IBM-MON	12" Monochrome Monitor .	$109.95
IBM-ICB	Color Card w/Printer Port .	$149.95
IBM-E384K	384K RAM Card.	$199.95
IBM-MB	Motherboard.	$349.95
IBM-10MBK	10MB HH Hard Kit.	$599.95
IBM-20MBK	20MB HH Hard Kit.	$799.95

IBM PCXT Equivalent 130 Watt Power Supply
UPGRADE YOUR PC!

• Input: 110V @ 60Hz • Output: +5VDC @ 15A, −5VDC @ 0.5A, +12VDC @ 4.2A, −12VDC @ 0.5A • Plug compatible connectors • Fits into IBM PC • Weight: 6 lbs.

IBM-PS. $99.95

IBM Compatible! DISK DRIVES

Documentation Included

RFD480	(Remex 5¼" DS full-ht.). . . .	$69.95
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SA455	(Shugart 5¼" DS half-ht.). . . .	$99.95
TM100-2	(Tandon 5¼" DS full-ht.). . . .	$99.95

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Complete with power supply, switch, power cord, fuseholder and connectors

DDE-1FH	(Houses 1 full-ht. 5¼" floppy drive) . .	$ 69.95
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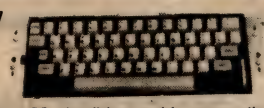
General Application Keyboards

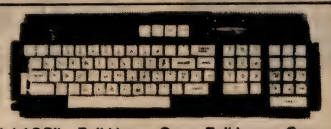
Mitsumi 54-Key Unencoded Keyboard



• SPST keyswitches • 20 pin ribbon cable connection • Low profile keys • Features: cursor controls, control, caps (lock), function, enter and shift keys • Color (keycaps): grey • Weight: 1 lb. • Pinout incl. • Size: 13⅛"L x 4¼"W x ¾"H

KB54. . . . . $9.95

74-Key ASCII Cherry Keyboard



• 7-bit parallel ASCII • Full Upper Case, Full Lower Case except l, m, n, o and p. • Cursor keypad • SPST mechanical keyswitches • 26-pin header connector • Color: white • Size: 18"L x 6¼"W x 1¼"H • Spec included

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DE-4 UV-EPROM Eraser. $74.95
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Attention Apple Computer owners. Apple work's 5 disks set with Tutorial $30, Bank street Writer $12, Spy Hunter $10. Write for our catalog. Send to: **Startrek Software,** Po Box 1137, NYC, NY 10035. Make check payable to: **William Moseley.**

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KEYBOARDS. $35 See "Apple Builder Keyboard" ad in category 108 for a super, full ASCII, 83 key keyboard which also works great with the Big Board/820 series computers. Thanks, **Electrovalue Industrial.** 1-83

COCO-50 very good programs in public domain on tape only $14.95. Disk $19.95. Four different packs to choose from. Send for free catalog. **P.D. Software,** PO Box 13124, Houston, TX 77219. 1-77

COMPUTEREYES by Digital Vision, $105. With camera $310. Modem with software, $64.97. Summer Games II by Epyx $26.75 **COMPUSERVE** Starter Kit $19.50. **Prices include shipping.** To order send payment or call. **VISA/Mastercard** accepted. PA residents add 6% Sales Tax. **Seneca Software,** 1104 Seneca Drive, R.D. #2, Harmony, PA 16037. **412-452-8418.**

CUSTOM APPLE PARTS

WE'VE OBTAINED a small supply of many of the custom ICs for the Apple II + and Apple IIe computers. These are real Apple parts, some new, some used, all tested and guaranteed. ROMs, keyboard encoders, P5A, P6A, video character generators, HAL/PAL, MMU etc. All priced below Apple wholesale. Enquiries from repair services who know what they want are welcome. We are NOT able to advise clone builders which parts are suitable for which clones. **Electrovalue Industrial,** Box 376-CP, Morris Plains, NJ 07950. 201-267-1117, M-F, 10-5. 1-83

Computer Accessories: Joystick for Apple $14 for Apple/IBM $23; locking disk storage holds 100 5¼ diskettes $12.95; diskette coupler cuts notches $6.95; shipping $2. **LYNTEK,** PO Box 1201, Lisle, IL 6053212-73

D.C. Hayes Micromodem II with B.I.T.S. terminal program and manuals $130. **Philip A. Wasson,** 9513 Hindry Pl., Los Angeles, Ca 90045. **213-649-1428.**

DISK DRIVE metal case. Color matches Apple. Several available, $10 each plus shipping. **Nexo Distribution,** 8824 Golf Drive, Spring Valley, CA 92077. 619-589-7928.12-73

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FREE PROGRAMS!! Apple-II/Applelle/Apple-IIlc/Apple MacIntosh/Adam/IBMpc's/Commodores/TI99-4A. Send stamps! **EZRAEZRA,** Box 5222PAJA, San Diego, CA 92105.

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Games!!! for the Apple IIe, IIc and III systems. Public Domain Disk full of games for $19.95. Send check or money order to **Gennaro Conte,** 2522 Holland Avenue, Bronx, New York 10467. Compuserv ID: 74005,1064. 9-76

HOW TO repair the Apple computer by Data-Line. Original list $35. For Apple II/II + only. While supply lasts, $9 each plus shipping. **Nexo Distribution,** 8824 Golf Drive, Spring Valley, CA 92077. 619-589-7928.12-73

Home Security System for C64 V-20. Includes all hadware, software. "As cheap and easy to use as you can get." Personal Computing Magazine **215-398-0434. 2-75**

KOALA PAD with software $39; Parallel (Centronics) printer card and cable $30; Seial card $34; 300 Baud internal modem incl Apple & CPM software $30; Disk drive controller card $24; Disk Drive half height direct drive $95; everything perfect. **call 916-626-0401.**

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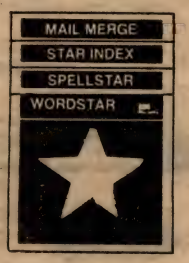

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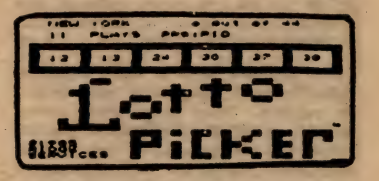

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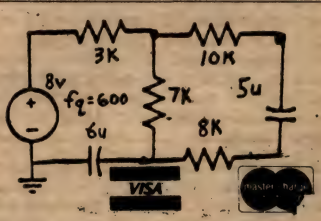

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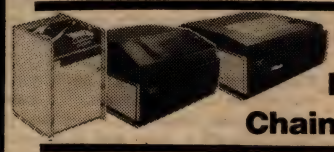

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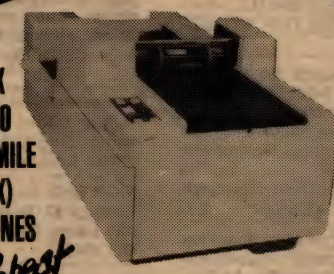

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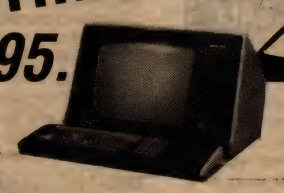

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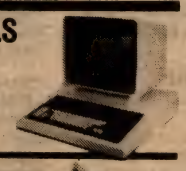

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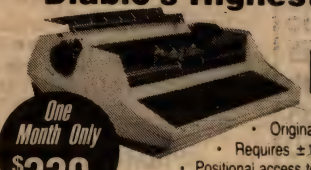

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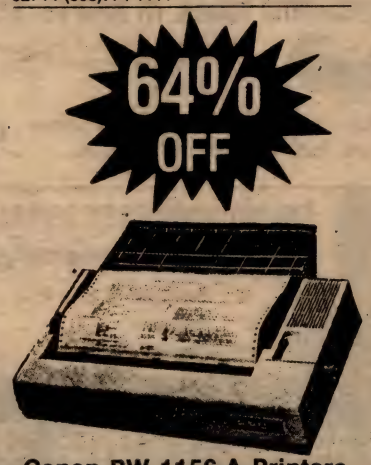

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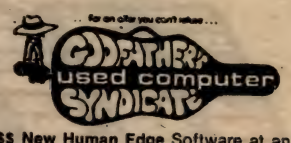

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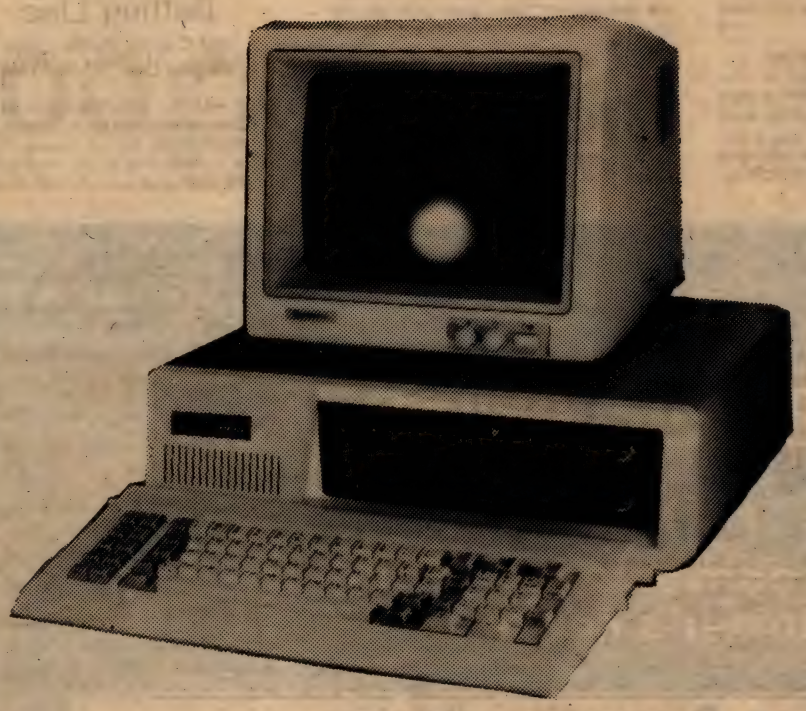

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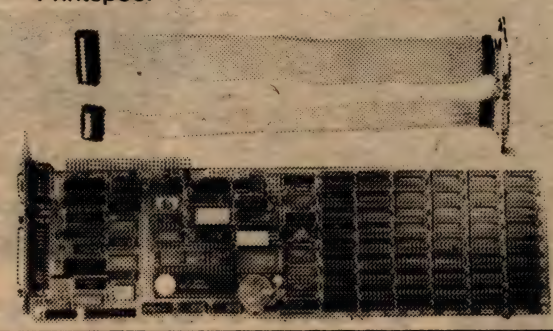

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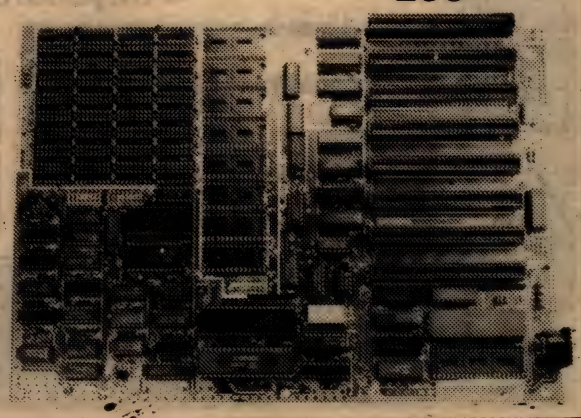

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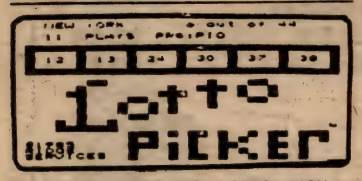

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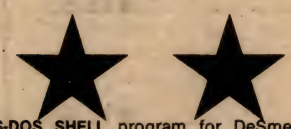

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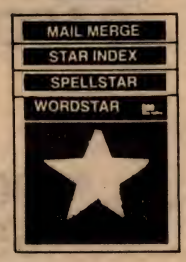

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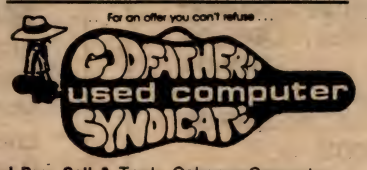

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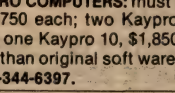

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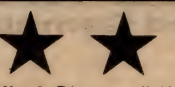

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43¢/PROGRAM for the best 70 Kaypro Public Domain programs - including 16 games (adventure, blackjack), 40 utilities, 13 application programs and Modem7 (Kaypro version). Send $30 for 6 disk set. **Public Domain Users Group,** Box 1442-K1, Orange Park, FL 32067. 1-75

CP/M PORT for KAYPRO

Now Kaypro owners can insert data from another computer through the serial port into Word Star, perfect Calc or any other CP/M program. Load data from an optical scanner or bar code reader directly into a word processor or spread sheet as though keyed. the keyboard remains active to receive changes or additions. It's easy to use. Just load the program at turn on, select the bit rate, remove the Microframe disk, and continue as usual. It will not permanently alter the system, but will remain active through warm boot. DESCRIPTION..CPORT for KAYPRO **$39.95.** Specify SS/DD or DS/DD from **MICROFRAME CORP.,** Suite 356A, 8236 E 71st. Street, Tulsa, OK 74133. **918-250-4839.**

Custom Printer Characters for Epson FX printers and Kaypro 84 series computers. Design and use your own characters. Requires MBASIC $13.50 PP. **E. Campbell,** Box 893, Mackinaw City, Michigan 49701.

Legacy 6Mhz Speedup Board for Kaypro 2-Like new $65 plus shipping. **Robert D. Hobart,** 231-5th Drive NW, New Phila, Ohio 44663. Call **216-364-3672.**

(123) SANYO COMPUTERS FOR SALE

★ ★ ★

Sanyo CRT 70 monitor, excellent quality, Super Hi Res RGB color, cost new $700, now ONLY $299. Call **313-334-6636.**

Sanyo MBC 555 2 drive SS/DD, $499. Call **Weber Systems 216-729-2858.** 1-73

(123A) SANYO COMPUTERS WANTED

MBC 2000 in A1 shape, also Accounting software for same. **Dillon Realty Services, 305-574-5279 ask for Dean.** 1-73

(123B) SANYO SOFTWARE, PERIPHERAL

AT. LAST!

AN ALTERNATIVE!! Tired of shooting aliens? Ready for a game that tests your mind and not just your reflexes? Try OILWELL, a new simulation game. Explore for oil; drill oilwells; then buy, sell and refine your oil as you try to pay the mortgage and save your company. Runs on IBM, Sanyo, and other MS-DOS computers (specify format). Send check for $20 to: **MTK Software,** Box S, 809 W. Barre, Baltimore, MD 21230. 1-73

NEWPOKER! five card draw poker game for Sanyo 550/555. Fast, lifelike graphic cards. One to six players. Bonus RAMTEST and collectors' Western record album. Send $25 to: **SOUNDS of the OLD WEST,** 3210 Terry Drive, Toledo, OH 43613. 1-74

OMEGA

ARE YOU looking for a window program, that's not expensive? Well **OMEGA** has a graphics **CLOCK,** 30 year **CALENDAR,** and spelling **LEXICON,** which is called up from WordStar, EasyWriter, or any program, anytime. Also if you have an assembler and would like to try your hand at writing your own window software, the **OMEGA** disk contains the source code for **OMEGA, WINDOW** module, **CLOCK** module, and **CALENDAR** module. The **OMEGA** disk is for the standard **SANYO** MBC-550/555. Only $15 PP. **Bob Jack Software,** 8371 White Road, Burbank, Ohio 44214. 12-73

OPUS

Are you tired of expensive terminal programs which don't work correctly on the Sanyo? Well, the OPUS series is for you. They are 'State of the Art' terminal programs written exclusively for the Sanyo 550/555. The OPUS series feature: Auto Logon, Auto Key, Xmodem, DC2/4, manual ASCII capture, full parameter control, disk utilities, on screen menus, windows, etc. OPUS 2 is for the standard Sanyo. OPUS 3 is for the Sanyo with Video Board. OPUS 2 and OPUS 3 with 41 page manual, $20 PP. **Bob Jack Software,** 8371 White Road, Burbank, OH 44214. 2-75

SANYO 500/555

80 Volumes-rent and copy for $1 each or we copy for you $3 SSDD, $6 DSDD, Sampler $5. Masstercard, VISA! Recorded info/order **619-941-3244** (anytime), or LSASE (specify computer): **Futuresystem,** Box 3040(C), vista, CA 92083.

Survey-Boundary 550/555 MSDOS 2.11 $29.95. Manual only $1.00. **P. Billings,** Dept. CSA, 12134 Bonnie Terr., Seminole, FL 33542. 1-77.

XENO

This disk contains the famous XENO disk editor, and a whole set of utilities and games programs. With XENO, you will be able to look at and change any byte on any disk. All these programs come with source codes. We have placed these programs in the public domain, however when you consider the charge of BBS time, PHONE time, and YOUR time to get the whole set, it's cheaper to send for your disk. XENO disk, $15 PP. **Bob Jack Software,** 8371 White Road, Burbank, OH 44214. 2-75

(125) SINCLAIR COMPUTERS FOR SALE

(125A) SINCLAIR COMPUTERS WANTED

(125B) SINCLAIR SOFTWARE, PERIPHERAL

10 Back Issues various Sinclair magazines, programming book and reference card. $48 value, only $16. **Reilly,** 395 Wimbledon Road, Rochester, NY 14617.

2068 BANNERS with your 2040 printer. Includes alphabet, numbers, punctuation. Easy to run. Sample $2. SASE. Cassette $14.95 PP. **David Trevor,** Box 46208-T, Phoenix, AZ 85063. 11-78

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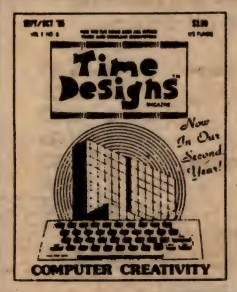
Compusa disk Utilities. Add capability to copy disks, read fractional tracks, recover deleted files, more. SASE for information. **SiriusWare,** 6 Turning Mill Road, Lexington, MA 02173. 2-75

FREE CATALOG, Timex Sinclair 1000, 1500, 2068. **Basically Programming,** Dept. C. 2528 W. Olive Avenue, Fullerton, CA 92633. 714-738-0666. 7-75

FREE CATALOG Timex Sinclair Hardware and Software. Books Spectrum programs. QL information British Magazines. **Curry Computer,** 5344 West Banff, Glendale, AZ 85306, 602-978-2902. 9-73

FREE PROGRAMS!! Timex-1000/Timex-2068/all IBMpc's, Apples, Commodores, TRS-80's/TI99-4A/Adam. Send stamps! **EZRAEZRA,** Box 5222PJA, San Diego, CA 92105.



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Do you subscribe to the "Top Rated" publication for your 2068 and TS 1000/1500? TIME DESIGNS MAGAZINE...published on time, interesting articles/programs, latest news and exclusive Shopping Mart section. Now in our second year. Only $15 year/six issues. Discover what hundreds of TS users nationwide already know. Send check of M/O to: **TIME DESIGNS,** 29722 Hult Rd., Colton, OR 97017.

QL CATALOG

SOFTWARE-HARDWARE-BOOKS-MAGS Q-DISK Interfaces, disk drives, monochrome mon. cables, printers, Centronics interfaces. **Software: ZKUL, WEST, GRAPHIQL WD** Utility, PASCAL, FORTH, BCPL, Assemblers, Blackjack, **QL,** Diary, **AND MUCH MORE.** Write for **FREE CATALOG** to: **CURRY COMPUTER,** 5344 W. Banff, Glendale, AZ 85306, 1-602-978-2902 11-75

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QUICKEY 2068. Increase memory when using TASWORD II and or TASPRINT. Customize your TS with a durable keyboard overlay gives you instant reference. Also avail for MSCRIPT. Send check or m.o. $3.99 + $.50 shipping & handling to: **AN-TO Productions C.,** 9009 W. Elm St., #2, Phoenix, AZ 85037. 1-74

Survey-Boundary program Sinclair T/S 1000 $19.95. Manual only $1.00. **P. Billings,** Dept., CSC, 12134 Bonnie Terr., Seminole, FL 33542. 1-77

TIMEX/SINCLAIR Brand Name Software **CLOSEOUT!** Over 50% off all titles. Call/Write for complete list. **NEXO DISTRIBUTION,** 8824 Golf Drive, Spring Valley, CA. 92077 (619)589-7928 12-73

TS1000-Adventurer's (16K RAM) all new adventure-Survival game with a twist (The Island) the twist is if you survive (make it to the end) you will find a secret number. Send this number to us and we will issue a verified survival certificate. Each game costs $12.00 on cassette (postage included). California Residents add 6% tax. To order or for a free brochure write: **O.F.A.,** P.O. Box 235, Oakdale, CA 95361. 1-74

XZ81/TS1000. Build your own 64K RAM pack 8-12K and 12-16K blocks are switchable in/out. Only (14) IC's required - includes (2) double-sided plated through PCBs with schematic and assembly drawings. Fits small Hammond case. Send $20 to **MRP Technology,** PO Box 340128, Tampa, FL 33694. 813-961-2595 (7-10 PM). 12-73

(126) MISCELLANEOUS MICROCOMPUTERS

COMPAQ computer w/640K RAM; near new, in carton, $1800. Call **415-859-5848.**

CPM $100, Dual 8 inch SSDD drives, serial board, WordStar, DBII, pearl, pascal, SuperCalc, basic, $350. Televideo 925 Terminal, 300 Baud Modem $350. Computer, terminal, modem $650. Cables, documentation/digital group 64K, dual 8 inch drives, SSSD, SDD controllers housemaster, Sweet Talker boards, Software, diskmon, CPM, oasis, MCOS OP systems. Much software word processing manuscriptor. 9 inch Sanyo monitor, keyboard, in dress cabinets, cables, documentation $450. Digital Group digital cassette system (Phimon) 64K, 12 inch monitor, SD disk board, software, cables, doc. $150. Micromint Z8 controller power supply, Triac board, Documentation $50. Two Shugart 850 DSDD drives, disk powersupply, cables, documentation, $100. 3 non-working 8 inch drives (Innovex) in cabinet, $10 each. Cash, check or money order to: **Pat Rankin,** 13509 Agua Dulce, Castroville, CA 95012. Telephone **408-633-3442.** I will pay all shipping costs.

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Comp-Used: Buy or sell any systems, peripherals or software. Any computer product over $100. **203-762-8677.** 12-73

DIGITAL MICROSYSTEM DSC-2 computer with 27 Mbyte hard disk, 2 8" floppies, Oasis and CP/M with 12 Mbytes of Oasis software. $2000. **Fred, 805-965-0265.**

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Eagle PC complete matched set, 256K keyboard monitor CPU GWBasic, Eagle Cal writer DOS, will sell as complete unit only! Less than 5 hrs. operating time $1800. **Dan Domeracki,** 5617 Louise Way Dr., Arlington, TX 76017. 1-76

Epson Geneva Portable 256K, CP/M, WordStar, portable thermal printer, file transfer cables, $1000; **Keith Wood, 415-824-8013.**

Epson PX-8 perfect laptop with manuals and printer cable, run WordStar anywhere. Only year old $500. **205-271-1382 evenings.1-73**

MULTIUSER COMPUTER! Digilog 1800 inventory liquidation, contains 1-96TPI floppy and 1 seagate 5mb Hard drive. Runs Turbodos operating system and CP/M. Supports 16 workstations, in factory carton $610; Workstation $100. **Call 301-498-0121.** 1-73

Morrow MD-3, CP/M, monitor, serial, parallel, New Word, $700. **Keith Wood, 415-824-8013.**

NCR First Step 64K CP/M computer, two 544K disk drives, Wordproc, Spread sheet and comm software, $969. **818-716-5220.** 1-73

Sage II computer, 512K RAM, dual 640K floppies, P-system OS. Asking $1500. **John T. Hughes,** 580 Campbell Blvd., Getzville, NY 14068. 716-689-8637. 2-75

VECTOR GRAPHIC 2 VSX-3000 micros each with 236K add'l RAM; 10Mb hard disk; 714K Floppy drive; keyboard; LINC network board. One year old. Including CCP/M-86; MS.DOS; Vector software including word-processing, spreadsheet, graph, and communications; database software. All for $10,000 obo. Each machine sold separately for $4,000 without software. **Bruce Powell,** 16255 Ventura Boulevard, Encino, CA 91436, **818-986-4727 days.** 2-76

Wanted: Toshiba T-100 software and hardware. Also Orbis 8" drives. **714-986-2554.**

(127) XEROX COMPUTERS FOR SALE

4MHZ Xerox 820 with two 8" drives, power supply in rugged cabinet includes keyboard and box of ten "USED" disks $350. FOB. **H. Chiv,** 10137 Pasture Gate, Columbia, MD 21084 **301-997-5700 evenings.** 2-74

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(127A) XEROX COMPUTERS WANTED

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Announcing the ICD "REAL-WORLD" DEVELOPMENT KIT:

Now you can obtain "hands on" experience with analog and digital monitoring and control using the IBM-PC, XT, AT, Zenith 150 Series, and other PC-compatible micros. The Kit includes all of the pieces that you need to immediately monitor and control "real-world" functions including light, air temperature, ground moisture, and other parameters with your PC. Includes 1 each:

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1 — **RTS-1** Remote Temperature Sensor
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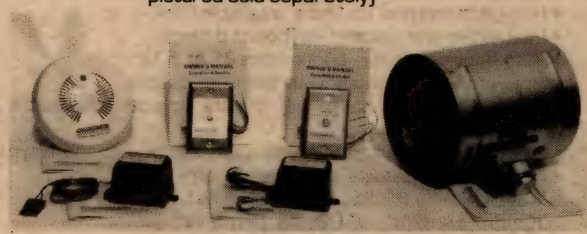
1 — **HVAC-1** System Remote Controller
(RSDA-1 Smoke Detector Alarm & ADV Series Air Duct Valves pictured sold separately)



6 — **4-Foot Cables w/Connectors**
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1 — **"How-To" Application Notes/Book**
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These components represent a $1750 retail value if purchased separately — all for only $995!

Create a powerful computerized monitoring and control system for your office, factory, or home! Take advantage of this "bargain" opportunity to learn about microcomputer interfacing in the "real-world"!

Use Your PC for Energy Management, Process Control, Lighting, Security Systems, Laboratory Processes, Temperature Regulation, Irrigation Systems, Narrow-Bandwidth Voice Digitization and Reconstruction and many other "Real-World" applications! Contact your local ICD Products Representative or ICD directly to place your order today!

Limit 1 "Real-World" Development Kit per customer. Offer good through 3/15/85. Company P.O.'s accepted: Stock Number DKPC-01. Allow 2-4 Weeks. Shpg. Wt. 19 Lbs.

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(127B) XEROX SOFTWARE, PERIPHERAL

— BIG BOARD BUILDERS —
KEYBOARDS $25. See "APPLE BUILDER KEYBOARD" ad in category 108 for a super, full ASCII, 83 key keyboard which also works great with the Big Board/820 series computers. Thanks, **Electrovalue Industrial.** 12-82

PRODUCE YOUR own flight plan. Custom navigation program for Xerox or Big Board users. SASE for details. **G.T.L. Labs,** 1890 West Hillcrest #521, Newbury Park, CA 91320. 12-75

XEROX 820-1

SUPER BIOS

$39.95

350K Storage on a 80 track double sided drive. Supports 40TSS, 40TDS, 80TSS, and 80TDS formats simultaneously. Includes source, format, single drive copy and sysgen programs. Also includes new monitor EPROMS which allow boot from either keyboard or a seperate terminal, and also has a command to allow the Xerox to function as a stand alone ASCII terminal without disk drives.

XEROX 820-1
SYSTEM FOR
VIDEO ADAPTER
$17.95

Inputs Xerox vvideo signals and outputs proper composite video for monitors. Assembled and tested PC board with all proper connectors. Requires soldering on the 820.

MRS/OS OPERATING
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XEROX 820-1
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Completely CPM compatable disk operating system on a 5¼ bootable disk. Includes users manual, Super Bios installed, the new monitor EPROMS mentioned above and all utilities and source supplied with Super Bios. The fastest way to a working 820-1 system.

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(128) MISC. MICRO, SOFTWARE, PERIPH.

1000's of FREE SOFTWARE programs for over 80 computer formats including **IBM, CP/M & COMMODORE** from the **Public Domain Users Group.** Over 5900 members worldwide. For information send SASE to: Public Domain Users Group, 1442-C3, Orange Park, FL 32067. 1-73

5 Megabyte Hard Disk Drives, unused $50 each. These are 8" SA1002 Shugart Winchesters. Controller kit $200. Will interface to most computers: 6809, Z80, STD, S-100, Flex, CP/M, Apple, Heath. **Call Digital Search 803-877-9444.**

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Seattle Computer Products 8086-10MHz Process, Diskmaster, 256K, 16MBHD, 2-8", 1-5.25" floppies, TEI-12 box, Telev-925 Terminal $2000. Second TEI-12, Diskmaster, Prsupp, 8086-10. Make offer. **206-857-4815.1-73**

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WHY PAY DOUBLE? CLONE/MS-DOS Software for $3/DS-DD DiskFULL (including disk). **804-851-6864. Colony,** Box 808, Langley AFB, VA 23665. 2-74

dBASE II/III, WordStar letterhead logo graphics strategies with most printers. Single or multiplage report headers. Source code, documentation, $7.95. **Harvey Gardner,** PO Box 340, Huntington, NY 11743. 11-74

(129) S-100 COMPUTERS

4 MHZ Z80 computer & terminal, 315K Fdisk and 15 Megabyte Hdisk, complete business software, $1269. **818-716-5220.** 1-73

ALTAIR 8800 COMPUTER with CPU, 12K RAM, $200/BO. MSD 80x24 video $50. SSM IO4, 2-serial, 2-parallel, $40. **Richard Rodman,** 6607 Mayfair Drive, #302, Falls Church, VA 22042. **703-241-1681.**

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COMPLETE S-100 SYSTEM. Jade 2/4MHz Z80 CPU. Computine 5"/8" DS/DD FDC. Supports many popular 5" and 8" formats, ideal for 8" to 5" file transfers or 16 bit upgrade. Digital Research 64K SRAM. SSM 2SIO-4PIO I/O board. Complete with PS, enclosure, and software library. Shugart 850 8" DS/DD drives with PS and enclosure. No reasonable offer refused. **215-782-1452, evenings.** 2-75

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CROMEMCO Z2D cabinets with 21 slot motherboard, power supply $300. Cromemco Tuarts $65. Seattle 16K RAM $65. Wanco 5.25" drives $50. Dual Persci 8" drives, $100. **Anthony Nowakowski,** 2294 Long Road, Grand Island, NY 14072. 716-773-3821. 1-73

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S-100 ENTHUSIASTS! Write the S-100 BOARD BANK for savings on USED items. Subscribe to THE STATEMENT, the irregular, official organ of THE S-100 BOARD BANK. Send $4.37 or more to **S-100 Board Bank.** Mailorder Dept. C2, Box 344, Olympia, WA 98507. 1-77

S-100 Computers
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X120 DOUBLE DENSITY CONTROLLER BOARD
Unsurpassed double density operation, designed for easy mounting on the Xerox 820-1 (or BBI). Uses the 2793 double density disk controller.
- Runs any combination of 5 ¼" or 8" disk drives, up to four at a time
- Standard 34 and 50 pin Shugart compatible disk drive connectors on board, as well as returning signals to connector on main board
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- 3 ½" x 4 ½" high quality, solder masked, double sided board with manual and schematic
- Designed to work with XPRO or PLUS2 rom sets.

Bare board	$ 26.00
Board assembled and tested	$120.00
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Hard to find parts set	$ 12.00

See below for board with rom packages

XPRO ROM SET by Micro Cornucopia
Turns your Xerox 820-1 into a Kaypro compatible with superior speed and versatility.
- Runs 63K system for more available TPA
- Fast video and parallel keyboard drivers
- Auto-boot capability, boots from 8" or 5 ¼"
- Rom monitor functions with menu of options
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- 98% software compatible with both Xerox 820 and Kaypro
- Automatically selects disk formats for:
  Kaypro II - 191K, SSDD, 48TPI, 5 ¼"
  Kaypro 4 - 390K, DSDD, 48 TPI, 5 ¼"
  Kaypro 8 - 784K, DSQD, 96 TPI, 5 ¼"
  Xerox 820-1 - 82K, SSSD, 48TPI, 5 ¼"
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- True double sided operation
- Can be operated with a terminal for console device
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- Works with X120 board for double density

XPRO Rom Set ..... $ 49.95

PLUS2 ROM SET by MICROCode Consulting
Turns your Xerox 820-1 or BBI into a Kaypro compatible with superior speed and versatility.
- Boots from 820-1 disk or our advanced BIOS
- Bank selected for efficient use of program memory
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- Supports multiple disk formats with utility program
- Includes disk format program, CBIOS source, utility programs, manual, and 2716 roms
- Works with the X120 board for double density

PLUS2 Rom Set ..... $ 49.95

Board and Rom Set Package Prices:

X120 Board A&T with rom set (specify)	$160.00
X120 Bare Board with rom set	$ 72.00
X120 Full Kit with rom set	$139.95

Call for other package prices

Include $3.00 for Shipping and Handling (under 2 pounds); $6.00 for COD; 3% for Bankcards. Add $3.00 for each disk drive or cabinet. Phone hours - 8:30am to 5:00pm weekdays; 10:00pm to 7:00am by modem (same phone number) seven days a week.

UNIFORM by Micro Solutions
The solution to the diskette incompatibility problem. This program allows files to be run or transferred back and forth between close to one hundred different computer formats, including 96 TPI-5 ¼", and 8" diskettes. Lists computers by name, with no special technical knowledge required. Transfers between CP/M, MS-DOS, PC-DOS, and TRS-DOS formats.
Versions available from stock for Kaypro, Xerox 820-II, and Xerox 820-1 with XPRO rom set; others available
Uniform ..... $ 64.95

QP/M by MICROCode Consulting
At last an inexpensive replacement for CP/M, with full CP/M compatibility, and many enhancements. Includes 5 new system calls, and 9 new transient commands including time/date stamping of files, backup utility, and menu driven configure program. Runs on Z80 systems, in the same space as CP/M 2.2.
Available as bootable disk (does not require CP/M!) for the Xerox 820-I, 820-II, or the Xerox 820-1 with XPRO rom set.

QP/M with BIOS for PLUS2 or XPRO rom	$ 64.95
QP/M with BIOS for Xerox 820-I or 820-II	$ 80.00
QP/M without BIOS (not bootable)	$ 60.00

SEMIDISK 2 MBYTE DISK EMULATOR by SemiDisk Systems
Tired of waiting? The SemiDisk ram based disk emulator board is the single, most significant speed improvement that you can make to your system. And it's BIG enough to get both your program AND your working files on the SemiDisk at the same time, no waiting for one or the other to be accessed from a disk drive. Print buffer software included. Low power consumption - picks up its power directly from your system, with an optional battery backup package available. Works on Xerox 820, Kaypro, or any other Z80 based system.

2MB SemiDisk Board-assembled	$995.00
Optional battery backup unit	$150.00

PANASONIC HALF HEIGHT DISK DRIVES
The finest new half height, 5 ¼" disk drives
Fast, reliable, with lower power consumption.

Panasonic JA551 - DSDD, 48 TPI	$ 99.00
Panasonic JA561 - DSQD, 96 TPI	$114.00

Include $3.00 each for shipping

SmarTEAM 103/212A MODEM
Auto-answer, auto-dial 300/1200 baud with full Hays compatibility. Metal cabinet, status LEDs, speaker with volume control, and phone cable $229.00

XEROX CABINETS AND ACCESSORIES
Our stock changes frequently due to quantities and availability of these items, please call to check stock and get shipping charges before ordering.

Xerox standard computer cabinet w/monitor frame	$ 95.00
Xerox high profile keyboard w/cabinet - new	$ 65.00
Xerox 5 ¼" disk drive cabinet	$ 18.00
Xerox 5 ¼"disk drive cable	$ 12.00
Power connectors for 820 board (pc) or PS (cable)	$ 2.50
Switching power supply for 8" drives	$ 69.00
Xerox 820-I boards, working	$ 95.00
Parallel ASCII keyboard (not Xerox) made by Keytronic, typewriter keys only	$ 25.00

EMERALD MICROWARE

P.O. BOX 6118 ALOHA, OR 97007 (503) 642-1860

VECTOR GRAPHIC 3005 (made up from VG parts): drive reads double and quad density disks, 64K memory, 5MB hard disk, etc., plus clock. NEC 7700Q converted to serial. Both for $2800 plus shipping. **Time Series Assoc.**, Tel. 415-324-1821. 1-73

Vector Graphic with 15 Meg hard disk, 1 floppy disk, keyboard and monitor, printer, tons of business software $1369. **818-716-5220.**

WANT S-100 CARDS!

BOARD BANK BUYS 'EM ALL! (Well, almost.) ROM, RAM, CPU, VIDEO, GRAPHICS, I/O, AD/DA, FDC, HDC, SPEECH, the uniquer the better! Convert your extras to CASH. We buy SYSTEMS, peripherals too. Send FULL description and CHEAPEST asking PRICE to **S-100 BOARD BANK**, Mailorder Dept. C-1, Box 344, Olympia, WA 98507. 1-77

Z80 4MHZ 56k CP/M, dual floppy disks, keyboard and monitor, printer, tons of graphic games and business software, both wooden adn metal chasis $769. **818-716-5220.**

(130) S-100 COMPATIBLE, PERIPHERAL

12-slot motherboard, **IEEE 696** standard, active termination, used, $50; **CROMEMCO ZPU** (Z-80) board, used, $40; **SDS EXPANDORAM II** 64K RAM board, used $40; **MICROMATION DOUBLER** floppy controller, used, $40; **TRIPP-LITE** 200W emergency power supply, new w/manual $75. Postage not included. Contact **Laslo 415-268-9527**, after 6 PM.

2 LSI Shuggurt 801 disk drives, $100 each; 1 well used, but running Televideo 900 terminal $75; 1 new televideo 900 terminal $175. Call **715-723-1925 after 5:00 pm ask for Doug.** 2-75

5 Megabyte Hard Disk Drive Subsystem for all S-100 systems. Kit $450. **Digital Search 803-877-9444.**

8K STATIC RAM $25. 2-Calcomp 142 8" w/Imsai case, $225. 2-Calcomp 140, w/case $200. 1-Adds Regent 60 CRT $225. Centronix 781 printer $85. **615-355-1061.** Jim Carroll, 304 Lexington Dr., Smyrna, TN 37167. 1-77

Alloy Tape Backup Unit with S-100 control board & software. $750. Excellent Condition. **Paragon Computer Corporation, (203)525-0389.** 12-73

Anyone having information on the MSC-9391 hard disk controller for the S-100 bus, a patch into CPM 2.2 bios, or an install program. Please call Larry at 615-764-0157 between 9:00 AM and 5:30 PM EST. I hope to use this with two Segate ST-506 5 Meg. drives. I'm willing to pay a fair price for your software.

EPROM programmer by Ackerman Digital, will burn all 1-2-4-8k EPROMS, with software and docs. $250 OBO. **215-782-1452, evenings.** 2-75

MICROPOLIS CONTROLLER & drive $169; Promblaster $95; GB Z80 6MHZ $150; Ad SuperSix $369; 64K print buffers $125; North Star DD controller $150. **818-716-5220.** 1-73

Micropolis controller & drive $169; GB Z80 6MHZ $150; 64K Print buffers $125; North Star DD controller $150. **818-716-5220.**

RODIME 21-MEG hard disk with Konan controller. **George**, St. Benedict's Farm, Box 366, Waelder, TX 78959, **512-540-4814.**

S-100 Boards CCS2710 4-port Serial I/O interface, $265; Astec 32K Memory Boards $45. **216-233-8638 after 5:00 pm.**

WANTED: Ithaca Audio Z-80 CPU IA1010 Rev. 1.3 or higher. 2 or 4Mhz with documentatin. Must be clean and working. **516-374-4168 eves.**

(131) S-50 COMPATIBLE, PERIPHERAL

5 Megabyte Hard Disk Add-on for SS-30 or SS-50 from $450, with software and interface. **Digital Search 803-877-9444.**

(132) HEATH COMPUTERS FOR SALE

H89 SINGLE floppy, 64KB memory with C compiler, Fortran, Wordstar, Basic, plus much more. $500. Ask for **Chuck, 818-357-9527.** 1-73

Z-100 LOW profile, 768K, 8MHz, color, 2-5¼ drives, GEMINI board, color monitor, all manuals for machine, lots of software. AMADEX 9501 printer, 15" carriage, graphics, serial/parallel, 200 CPS, Multiple fonts. Sweet-P plotter. $3500 for all, shipping included. Call: **Jim** 216-984-2685 or **Art** 216-282-4790. 1-73

ZENITH 110 LOW PROFILE 2-DD drives 192K 8 & 16 like new. Lotus 1-2-3 Access-Peach Tree 5000 plus several others. Zenith monitor Hayes 300 modem, All cables - list over $4500, will sell for 1st $2100-Prepaid all manuals. **305-655-7797** days 'til 5.

(132A) HEATH SOFTWARE, PERIPHERAL

5 Megabyte add-on Hard Disk Subsystem for Heath-89. Kit $475. **digital Search, 803-877-9444.**

PREOWNED SOFTWARE for H/Z-100. Lotus 1-2-3 $65. Wordstar 3.3 with Mailmerge $75. Z-Basic $50. GW Basic $50. Cobol $50. dBase II $60. Sideways $20. Informer $20. Genie $25. PC Emulator $25. Additional programs available, ask for list. **505-266-2344.** 12-73

SPEED MODULE for Heath H89. Software selectable 2/4 MHz. No board modifications required. $34.95 including shipping. **Micronics Technology**, 449 Barbados Way, Niceville, FL 32578. 904-897-4257. 12-73

(133) BURROUGHS SYSTEMS

BURROUGHS B-92-CSY, 3/6 MB inbuilt mini disk, 38.7 MB fixed disk, memory upgrade 128 to 256, two peripherals. Reasonable offer. Contact Charlotte **205-556-1943. 10-74**

(134) HEWLETT PACKARD COMPUTERS FOR SALE

21MX System, 2108A 32K CPU, extender 12979A, 16 MUX 30062A, 7900A drive, reader 2748B, HP cabinet, all or parts, best offer, **301-474-7405.**

BUY/SELL USED COMPUTERS
Quick/Easy/Best value•Thousands of items• For sale by owners•National Listing Service•No Commission•Only $22.95 to list until sold!

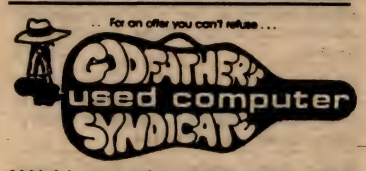
1-800- TECTRAN
800-832-8726•VISA/MC Accepted•617-491-4888 2-74

HP-150 with 15MB hard disc. All software imaginable. Must sell now. Touch screen. One owner. Perfect shape. $2800 firm. Call **501-377-2093 now.** 11-74

HP Integral PC, 786K RAM, Basic compatible with series 80, UNIX operating system, $4000. **615-525-6358** leave message. 2-74

$$$$ I buy, sell & trade Hewlett Packard Computers. **Godfather's Syndicate,** 1154 W. SR 436, Forest City, FL 32714. 305-774-1111. 1-73

(134A) HEWLETT PACKARD COMPUTERS WANTED



$$$$ I buy, sell & trade Hewlett Packard Computers. **Godfather's Syndicate,** 1154 W. SR 436, Forest City, FL 32714. 305-774-1111. 1-73

(134B) HEWLETT PACKARD SOFTWARE, PERIPH.

★ ★ ★

HP-71B SPREADSHEET

ORDER SS71. Use your time solving problems, not writing programs. SS71 is the first, best, and lowest price true spreadsheet program for the HP-71B. Many features. Fully portable on the LCD, or full-screen editing on the 80 column video. Four data entry modes. CALC, BASIC, SS71, or your program. Add cells with plug-in RAM. Values, labels, formulas, and custom formats. Send $60. Receive SS71 on a new HP 3.5 inch disk to tape cassette (your choice), instructions and sample data. Mail to **Rich Hairston,** 1226 Mission Ave., Carmichael, CA 95608. 1-73

STOCK MARKET programs for HP 86/87 computers. Powerful programs for selecting and evaluating stocks and commodities. Send $39.95 to **Lock Software,** Box 3163, Baltimore, MD 21228. Specify disk size. 9-79

(136) DATA GENERAL SYSTEMS

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(138) DATA GENERAL SOFTWARE PERIPH.

(148) DEC SYSTEMS FOR SALE

★ ★ ★

Comp-Used: Buy or sell Dec. or other systems, peripherals or software. Any computer product over $100. **203-762-8677.12-73**

DEC Pro350 system w/512k, 2 drive, 10M HD, floating point adapter, LA50 printer, Mono monitor, cables. List $7940, ask $4400. W/Comm. software $4500. **714-627-7411 Ken.** 2-75

★ ★ ★

DEC Rainbows 100B 128-893K, CPM/DOS, some graphics, color, large amount of software. Start at $1800. **305-777-4663 or 773-3417.** 1-75

★ ★ ★

LIQUIDATION
Rainbow Software

Wordstar Professional	$175
Lotus 1-2-3	$225
Microfocus Level 2 COBOL	$150
Microfocus CIS COBOL	$150
Condor3	$150
Poly X/FR	$50
Select 86	$30
Daisy Aids	$25
MS DOS 2.05	$35
CP/M -80/86 20	$35

Many have been opened, but all are compelte packages. **Call BCE 202-944-3900.**

MICROVAX-New systems with 190mb disk, reel-to-reel tape available and Decnet. Call for specifics. **301-490-3608.** 1-77

★

MINT CONDITION

Rainbow 100B w/256K, only 10 months old and immaculately kept, dual 400K drives, LASO 100cps printer w/original ribbon, CP/M, MS/DOS, dBase II, MBasic, PolyCommunications, 1200 Baud Modem, inclues screen cleaning kit, full documentation, adn original boxes if desired, Very well cared for, leave name, phone #, and reasonable offer. Must Sell. **Harry Kastrinakis,** 24 Carew Terrace, Springfield, MA 01104 **413-737-2259.**

PDP11/03 COMPUTER. 64K, EIS/FIS, dual floppies, 3 serial, 2 parallel, HT11/RT11 compatible. Includes OS, basic, fortran, "C", macro assembler software and documentation $1500; Televideo BT970 VT100/VT52/DS40 compatible terminal $700. Call **Jim 404-642-1722 (evenings) or 404-529-5451 (days).** 1-73

PDP11/23 System 160kb, MMU, FPU, floppy, 10mb disk, multiple ports, terminals, printers, spares, DEC installation- $9000 complete. Ideal for laboratory/educational applications. **Ed 614-846-6248.** 1-73

PDP15 COMPUTER two hard disks, three Dec tapes, Graphics 15VT console, cables, books, etc. $4750. **Andy Parramore,** Box 17, Mt. Pleasant, FL 32352. **904-856-5525.1-73**

(149) DEC SYSTEMS WANTED

DECmate II or Rainbow 100B to 100+. Prefer green or amber monitor, gold key, LQPO2 or LQP 03 printer, WPS-8 or wordstar word processing software, DecSpell, modem. Call with what you have & lets see what we can work out. **616-244-5686** or Hawn, PO Box 57, Jones, MI 49061.

(150) DEC SOFTWARE, PERIPHERAL

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LIQUIDATION
Rainbow Software

Wordstar Professional	$175
Lotus 1-2-3	$225
Microfocus Level 2 COBOL	$150
Microfocus CIS COBOL	$150
Condor3	$150
Poly X/FR	$50
Select 86	$30
Daisy Aids	$25
MS DOS 2.05	$35
CP/M -80/86 20	$35

Many have been opened, but all are compelte packages. **Call BCE 202-944-3900.**

Quality Rainbow Software at Giveaway Prices
(See our ad in 115B IBM Software) **Software Salvage,** Box 640, Norwalk, CT 06856.

WORDSTAR PROFESSIONAL software for Rainbow. New in original shrink wrap. $125. Call 201-691-0655.

(154) IBM SYSTEMS FOR SALE

★ ★ ★

Comp-Used: Buy or sell IBM or other systems, peripherals or software. Any computer product over $100. **203-762-8677.12-73**

IBM MAINFRAME - System 3 Model 8 with 3 hard disk drives, line printer, two data entry consoles, complete system. Excellent condition, $1500. Call **315-986-2719.** 11-73

(155) IBM SYSTEMS WANTED

Paying $5.00 per pound for scrap tantalum capacitors. Any amount, fast payment! Ship: **Sciuto,** 103 Saratoga St., Lawrence, Mass. 01842. 9-79

(156) IBM SOFTWARE PERIPHERAL

★

HOT ITEM

PROVEN Fractal zoom graphic program for IBM PC and alikes. Requires COLOR monitor and 64K memory and PC-DOS or MS-DOS. Creates startling images by new **Virtual Graphic(tm) Process.** Program on disc - $14.95 includes postage and tax. Specify your system and disc format. Inquiries use SASE. VISA or MC O.K. **Herzog Company,** Dept. S5, 200 Monterey St. Suite 11, Brisbane, CA 94005. 12-73

IBM Color Graphics for PC. Only 2 left! $100 each, brand new. Also, IBM PC keyboards with PCjr adaptors, $160 for whole unit (not sold seperately). **Legacy Technologies Ltd., 402-466-8108.** 1-73

IBM PUBLIC DOMAIN

390 Volumes-Rent and copy for $1 each or we copy for you $3 SSDD, $6 DSDD. (2) Directory disks $7, Sampler $5. Mastercard, VISA! Recorded info/order **619-941-3244** (anytime) or LSASE (specify computer): **Futuresystems,** PO Box 3040(C), vista, Ca 92083.

★

PC-Jr. Second Disk Drive, uses modem slot, compatible with all memory expansions, Guaranteed, only $265, incl. S&H. **Computer Reset 214-276-8072,** PO Box 461782, Garland, TX 75046.

PUBLIC DOMAIN software for the IBM PCjr. Sample disk $6. Free list. **RPM,** Dept. A, 2019 Foucher, New Orleans, LA 70115.1-74

TOPVIEW $69. Display Write 3, $159. Three new,, were bundled with XT's. **507-289-0400.** 1-73

(166) MISC. (HARDWARE & SOFTWARE)

AT&T 3 B 2

CORPORATE DECISION to change market focus has forced our software development firm to offer for sale excess equipment including a two month old 3B2/300, AT&T's new 32 bit multi user computer, with 1MB of main memory, 32MB hard disk, 4 port expansion board, and UNIX System V operating system. Also TI-810 printer and AT&T 4410 CRT. All priced below our cost at $13,500, well below approx. retail of $18,500. Call Marty at **904-386-5184.** 1-73

Basic A 2.0 user manual by Columbia. 10 day money back guarantee. $21.95 + $3 postage. **Dave Gillespie,** 1331 N. Lotta Dr., Los Angeles, CA 90063. 2-75.

Diablo 3200 20MB disc, 32K bytes RAM, call **512-467-0071, Scott.**

SOFTWARE SWAP
Try commercial software before you buy. For details, send $1.00 to **ICK,** 131 E. 12th Ave., Columbus, OH 43201.

Want To Buy: Good Heath ET-100. **913-898-4695.**

(172) DISK DRIVES

8" DSDD ½ Height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to

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HARD DISK DRIVES

Segate ST 506, 5MB	$130.00
Segate ST 412, 10MB New	$325.00
CMI 5412, 10MB refurbished	$225.00
DISCTRON 514 10MB	$225.00
FUJITSU 2234, 84, 94	Call

FLOPPY DRIVES

MPI B52, DS/DD, Full Ht	$65.00
MICROPOLIS 1115V, DsQD, Full Ht	$95.00
QUME TRK 142 DS/DD ½ Ht	$100.00
MITSUBISHI 4853 DS/QD ½ Ht	$125.00

CALL FOR TESTED PRICES ON ANY ITEM BELOW

MICROPOLIS 1115V, SS/QD Full Ht, As Is	$35.00
TANDON TM100-1, 2, 3, 4, As Is Unused	$75.00
PERTEC Floppies, 200, 500, 600 Series	Call
SHUGART SA400 & 800 Series, As Is	$29.00 & Up
SHUGART SA860 DS/DD ½ Ht 8" Unused	$129.00

Attention Repair And Maintenance Houses
Major Subassemblies For Above Items Including
Power Supplies, Printers, Monitors, New And Used Fans
Head Assemblies, Motors And Boards

If You Don't Find It Here, Call Us!

(818) 982-1000

Availability Subject To Prior Sale

track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. **800-228-3411.**

8" DS/DD - 2 Shugart 850/851 drives in case with power supply $450. 2 Tandom 55-4 drives, 96 TPI DS/Quads. No Bezel or Latching Levers $35 each **512-673-1861 12-73**

8" SSDD ½ height Shigart MOD SA 810-1 unused condition with full one year warranty. Price $269. These drives have track to track access times of 3MS. They will replace Shugart MOD 800, 801, or any other 8" SSDD Drives, however, they require no AC to operate. **CEC,** 1745 Adrian Rd., Unit 1, Burlingame, CA 94010. **800-228-3411.**

8" SSSD Drives. $75. Can be used as Double Density. Removed from operational equipment. Shugart 8" 50 Hz, 220V conversion kits also available. **Digital Search, 803-877-9444.**

8" DSDD ½ Height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. **800-228-3411.**

CM3426 Winchester disk drive. 20.15 MByets formatted low power (same as Minifloppy) half-height. ST-506 interface, One Full Year warranty $369. **Cascade Electronics Inc.,** Route 1, Box 8, Randolph, MN 55065. **507-645-7997**

Cabinet for two 8 inch disk drives. Rack mount style, fan, all AC and DC wiring with power supply $100. **Cascade Electronics Inc.,** Route 1, Box 8, Randolph, MN 55065. **507-645-7997.**

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Comp-Used: Buy or sell any system, peripherals or software. Any computer product over $100. **203-762-8677. 12-73**

DISK DRIVES-BOUGHT & SOLD. 5¼ half height for IBM, Radio Sh. TEAC-55B $79. Panasonic 551-2 $79. Hard drive 25MB Disctron $325. 40MB Evotech $450. 19MB CMI $250. 5MB Tandon $70. Comrex plotter $219 (Sweet Pea compatable). **LCAL,** 52 Brookfield, Centereach, NY 11720. 516-732-1779. 12-73

DISK SERVICE MANUAL, DISK DRIVE TUTORIAL, PRINTER - PLOTTER MANUAL, COPIER MANUAL, COMPUTER PHREAKING, SUPER REINKING METHOD - More!! See enclosed display advertisement. Ifnormation ($1): **Consumertronics Co.,** Attn: Computers, 2011 Crescent, Alamogordo, NM 88310. 12-76

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DRIVES FOR SALE

Shugart SA800-2 $79, SA851R $139, TEC FB-501 5¼" ½ ht. SS/DD $55. Sixty day warranty-shipping extra. Documentation included with drives.

SPECIAL SALE

MPI 52S 5¼" DS/DD full ht. $55 plus shipping. **LDL ELECTRONICS, 13392 158 St. N., Jupiter, FL 33458. 305-747-7384. 2-74**

For Sale: 1 GDL Gráphics Board A-1000 with 8088 processor S-100, 128K $500; 1 Zenith 13" RGB ZU136-long persistance Monitor, $450; 1 Qume 102-A Terminal $350; 2 Compu-Pro RAM 17 (64K) $250; 1 Compu-Pro Disk 2/channel select $400. **Cal Coastal,** 5 East Gabilan Street, Ste. 2318, Salinas, CA 93902. 2-76

For Sale: $60 or B/O Shugart SS/DD disk drive model 400L single head, includes face plate for TI99/4A Peripheal Expansion system. **Jodeph V. Cusmino,** 9932 W 143rd Place, Orland Park, IL 60262. **312-349-2672.**

Innovex 200 8" SSSD Drives, excellent quality. Can be used double density. 4 for $100. Complete, but require alignment or adjustment. **Digital Search 803-877-9444.**

68% OFF

Tallgrass Model 3020
$995!

20 mg hard drives with tape back up. IBM PC, XT, AT compatible. 30 day guarantee; quantities limited. **Call BCE 202-944-3900.**

Micro-Floppy 3½" drives. 500k bytes Shugart Sa300 w/warranty - $169 each. NEC RD1035, DSDD (1 meg) - 175 each. Same interface as 5¼"drives. **Digital Search 803-877-9444.**

RODIME 21-MEG hard disk with Konan controller. **George,** St. Benedict's Farm, Box 366, Waelder, TX 78959, **512-540-4814.**

SHUGART 1004 10 Mbyte hard disk drive. Removed from equipment and working perfectly $135. Also, several 801 8" diskette drives at $45 each. **Fred 805-965-0265.**

SIEMENS 8" ssdd, new w/manual, $40; **SHUGART** 850 dsdd, complete, as is $25; **SHUGART** 801 ssdd, complete, as is $20. Postage not included. Contact **Laslo 415-268-9527,** after 6 PM.

Shugart Dual 801 drives in cabinet with power supplies and 801 manual. Made by LOBO $195. **914-331-9019 after 4 pm**

Shugart SA800-2 disk drives removed from service, tested and guaranteed 60 days $59; SA850 removed from service and guaranteed 60 days $99. **Cascade Electronics Inc.,** Route 1, Box 8, Randolph, MN 55065. **507-645-7997.**

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TANDY 1000 DRIVES

High wuality 5¼" half height disk drives, DSDD 360K. Easy installation, instructions included. 100% compatible, 30 day guarantee. $124.95 ea. **TLC,** 415 W. Dale #3, Flagstaff, AZ 86001. **602-774-8940.**

WANTED 1541 Commodore Disk Drives. $85 for those in working condition. Please call **800-221-7770 4-74**

Wanted: FWD5000 disk controller made by Scientific Micro systems. **Brent Watkins,** Box 80602, Fairbanks, AK 99708. **907-474-7479. 2-74**

Winchester Controller Kit. Will control most all popular hard disk drives, $200. Faster than Wester Digital WD1002 Controllers. SA1002 8" Hard Disk Controller also available. **Digital Search, 803-877-9444.**

Winchester Drive Sale. Shugart SA1002. 8" - 5 megabytes unused $50 each, controller kit $200. **Digital Search, 803-877-9444.**

8" SSDD ½ height Shigart MOD SA 810-1 unused condition with full one year warranty. Price $269. These drives have track to track access times of 3MS. They will replace Shugart MOD 800, 801, or any other 8" SSDD Drives, however, they require no AC to operate. **CEC,** 1745 Adrian Rd., Unit 1, Burlingame, CA 94010. **800-228-3411.**

8" SSDD ½ height Shigart MOD SA 810-1 unused condition with full one year warranty. Price $269. These drives have track to track access times of 3MS. They will replace Shugart MOD 800, 801, or any other 8" SSDD Drives, however, they require no AC to operate. **CEC,** 1745 Adrian Rd., Unit 1, Burlingame, CA 94010. **800-228-3411.**

8" DSDD ½ Height Shugart MOD SA 860-1 unused condition with full one year warranty. Price $279. These drives have track to track access times of 3MS. They will work as replacements for Shugart 800, 801, 850, 851. They require no AC to operate. **CEC,** 1745 Adrian Rd., Burlingame, CA 94010. **800-228-3411.**

(174) PRINTERS

C. ITOH, NEC owners - get Correspondence Quality print with our ROM installed. Our font replaces Proportional font. All other functions remain. If you have older C. Itoh or NEC 8510 or 1550 (with plastic bottom plate), send $30 + $5 S&H ($40 + $5 for newer style unit) for ROM and instructions, or SASE for sample of print qualities to: **Microtrend Computers,** 56 Ferris Street, Corning, NY 14830. **607-936-3053.** Allow 3 weeks for delivery. If ordering, please specify old or new style. Money back if not satisfied. 1-74.

Comrex Crite Only $339!!! List $599!! 18 CPS Daisywheel Parallel. Sheet feeder only $139! Both new in factory carton. Add 3% shipping. **606-255-2298, Datalex,** 1389 Alexandria #1, Lexington, KY 40504. 2-77.

DOT-MATRIX 132-CHARACTERS wide Practical Automation printer DMTP-6. RS-232 (to 1200 baud) or parallel ASCII input. Includes mechanism, control electronics, supply, cables, rack-mount hardware, and complete documentation, $60. **Peter, 813-327-5675** anytime. 12-73

Diablo P-11 dot matrix printer, (list $649) unused $200 each. 90-day warranty. 100 CPS parallel interface, excellent quality. **Digital Search, 803-877-9444.**

Diablo Print wheels #38100-02 Zerox #9R80057 Courier 10 #38102-02 Zerox #9R80059 Elite 12, #38107-01 Zerox #9R80064 Courier 72. $3.00 each or 6 for $15. **Cascade Electronics,** Route 1, Box 8, Randolph, MN 55065. **507-645-7997.**

Diablo or Qume printer power supply kit. $75. New QUME pin feed platens. $40. **Digital Search 803-877-9444.**

Epson FX-100, 160 cps, wide carriage printer, excellant condition, documentation. Cost $700+, $375FC. **Rich,** POB 4143, Rockford, IL 61110-0643.

Epson MX-100. Excellent Condition. $300.00 firm. **Paragon Computer Corporation,** (203)525-0389. 12-73

For Sale: 1 GDL Graphics Board A-1000 with 8088 processor S-100, 128K $500; 1 Zenith 13" RGB ZU136-long persistance Monitor, $450; 1 Qume 102-A Terminal $350; 2 Compu-Pro RAM 17 (64K) $250; 1 Compu-Pro Disk 2/channel select $400. **Cal Coastal,** 5 East Gabilan Street, Ste. 2318, Salinas, CA 93902. 2-76

Houston Instruments DMP-40-Z plotter. RSX232 interface, $560. DMP-29 plotter, RSX232 interface, $1200. **714-627-7411 Ken. 2-75**

Interface Kit for Diablo or Qume printers RS232 or Parallel, $95. Parts for Qume and diablo HyType I: Repairs, cases, power supplies. **Digital Search, 803-877-9444.**

JUKI 6100: Daisywheel printers if your printer is defective and Juki Industries or their distributor has declined to honor it's warranty to you. Please write to me regarding all the particulars write to: **DWP/6100,** POB 613, Pocono Pines, PA 18350-0613. 10-74

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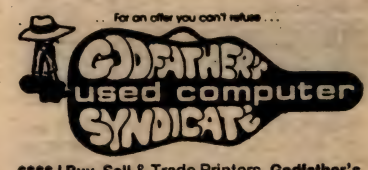

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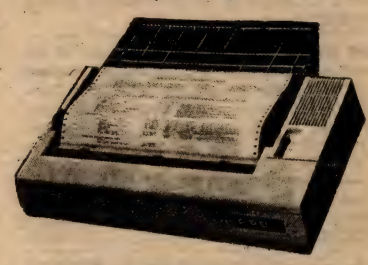

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Okidata 80 CPS, 7x9 DOT Matrix, friction feed, 10 characters per inch, 6 or 8 lines per inch, built in self test, new ribbon, 60 day guarantee, removed from service, parallel interface $99. Serial interface $119. Tractor feed free with printer. **Cascade Electronics,** Route 1, Box 8, Randolph, MN 55065. **507-645-7997.**

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(178) TAPE DRIVES

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(180) CRT'S

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(182) TERMINALS

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(183) MULTIBUS BOARDS

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Intel 86/30 SBC-8086 based single board computer, with 128k memory - new $85; Serial multimodules (351) $6. Call **301-498-0121.** 1-73

Interlan NI3010 Multibus Ethernet Board, New (list $1390) sell $950. **203-755-1180.2-75**

(184) MEMORY

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(186) MODEMS

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(188) MISC. EQUIPMENT

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(189) BOOKS, MAGAZINES

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(190) MISC. LARGE SYSTEMS

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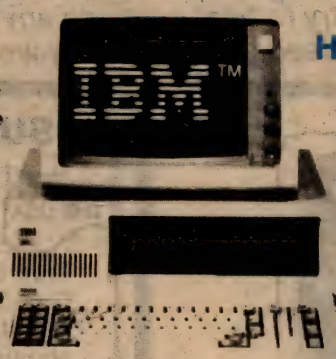

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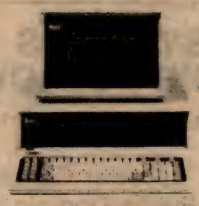

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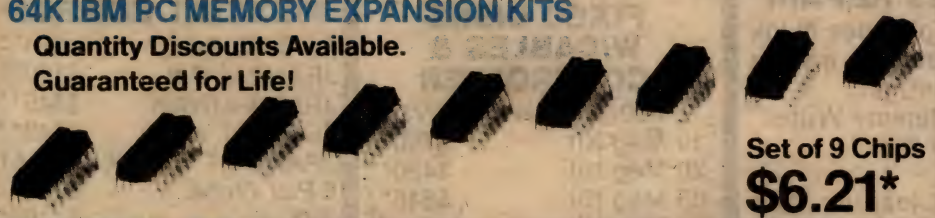

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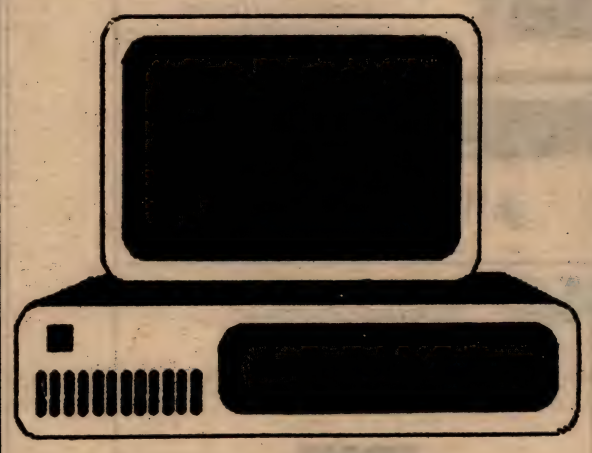

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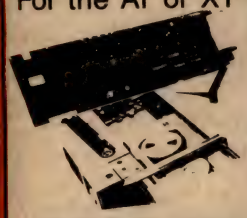

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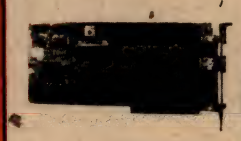

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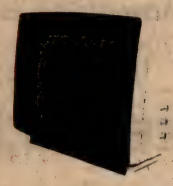

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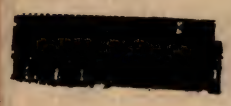

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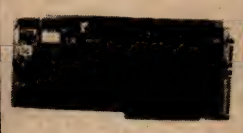

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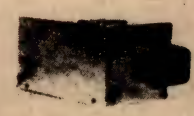

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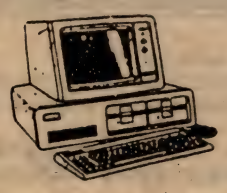

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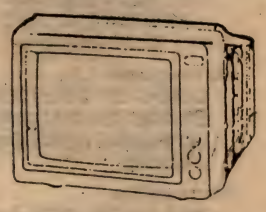

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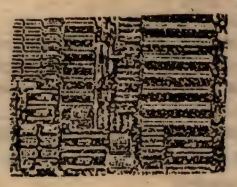

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8255	1	74LS322	1
8237	1	74LS244	6
8253	1	74LS245	4
8259	1	74LS27	1
		74LS20	2
64KDRAMS	36	74LS138	3
Digitals 74 S/		74LS02	2
74S280	1	74LS04	3
74S74	1	74LS08	1
74S157	1	74LS670	1
74S138	1	74LS175	2
74S00	2	74LS32	1
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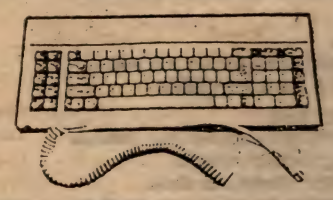

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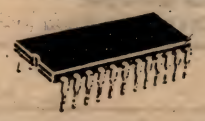

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The truth is many of our satisfied customers have discovered that our public domain and user supported programs are actually some of the best and most sophisticated software you can buy, at any price. The commercial retailers don't want you to know about us or our programs, but why pay hundreds of dollars more for software that won't do anymore than our $5.00 package. Here is a sample of our library by category.

Word Processors

PC-WRITE 2.4(#78) A full featured word processor.
WORDFLEX 1.60(#66) Another full featured word processor.
EDIT 1.11(#294) A general purpose text editor.

Screen editors

SCREEN(#86) A full screen text editor.
FRED(#83) A full screen editor.

Text processing tools

PC-READ(#194) Computes 'fog' index-Is your writing understandable?
REFLIST(#231) Reference lister.
UTIL 1.2(#60) A number of very useful utilities. UNWS(#81) UNWordStar converts from Wordstar to ASCII.
ROFF(#50,#194) You can make nice printouts of a file.
PASCAL TOOLS(#130-#132)

Database programs

PC-FILE III(#5) The most popular filing program.
DATABASE OF STEEL 3.1 (#214,#215,#267,#268) Database spreadsheet expert system.
NEWBASE(#233) Menu driven data base in BASIC.
FILE EXPRESS(#287,#288) Menu driven information management.
ABC-FILE 1.1(#119) A user friendly small database program.
3 BY 5 1.0(#253) File info on equivalent of 3x5 cards.
LABELS(#261) Address label system.
LISTMATE 1.0 (#252) Menu driven label maker for use with MultiMate.

Databases

LETUS A-B-C(#121-#123) Computer magazine references. Requires PC-FILE III.

BOBCAT(#247) business references.
MICROGOURMET 1.10(#116,#117)Food database, requires dBASE II.

Spreadsheets

PC-CALC(#199) A widely used, friendly spreadsheet by the author of PC-FILE III.
PC-CALC(Guy Gordon's)(#244) For smaller applications.
PC-PAD 1.3(#170) A word processing/spreadsheet program.
FREECALC V.1(÷170) Included spreadsheets for home budget and for business budget.

Spreadsheet templates

LOTUS 1-2-3® Templates and Macros (#140,#141,#165,#257,#289,#301-#304)
SYMPHONY® WORKSHEETS (#305-#306)

Financial Programs

FINANCE MANAGER 3.0B(#151) A Personal Small Business General Ledger System.
PC-CHECK MANAGER(#250)Can handle multiple checkbooks.
PERSONAL FINANCE MANAGER 4.5(#164) For the household budget manager.
PC-CHECK MANAGER(#275)Check register with ledger printout.
CDB(#282) Checkbook management.
HOME FINANCE ANALYST (#282) Home owership cost analyzer.
PERSONAL GENERAL LEDGER 1.3 (#165) Journals and General Ledger to be used as a template with Lotus 1-2-3® .
FEDERAL INCOME TAX FORMS (#290).
TAX FILE DBS (#295) Tax record keeping system.
SAGE TRADER(#242) Commodity trader analysis.
STOCK CHARTING SYSTEM 1.5 (#246)
CASH 1.0 (#261) Cashflow records.
PORTSWORTH PACKAGE (#101) for monitoring and evaluating your stock portfolios.
FINANCE (#227) Determines present and compounded values.
PC-GENERAL LEDGER 1.2 (#237) A complete accounting system.
POWER WKS (#289) Menu driven worksheets for Lotus 1-2-3® .
INVENT (#235) Inventory control.
TASKPLAN (#155) Keeps track of various projects.
TIME AND MONEY (#251) A simple financial record keeper.
BUDGETRK 3.3 (#155) Keep track of budgeted disbursements.

Communications

PC-DIAL (#129) A general purpose asynchronous communications program by author of PC-FILE.
QMODEM(#310) A PC-TALK III lookalike -fast.
PC-VT (#286) VT-100 emulation.
RBBS (#212) Bulletin board system.
LU (#190) combines files in libraries.
LINSQ (#120, #212) Un-squeeze - File decompression.

Math and Statistics

EPISTAT 3.1 (#88) Statistical analysis of small to medium-sized data samples.
SPPC SYSTEM DEMO (#232) Interactive statistical package.
COMPLEX.LIB 1.2 (#248) Library of complex math functions.
EIGHTCRV (#261) Performs curve fitting of two variables.

Languages

CHASM 2.13 (#10) CHeap ASseMbler with tutorial.
LADYBUG 1.0c (#94) Logo like program.
XLISP 1.4 (#148) The Lisp language.
Laxon & Perry FORTH (#263,#264)

Programmers tools

PROGRAMMER'S CALCULATOR (#87) A powerful RPN calculator plus a fast and efficient way to convert numbers between dicimal, hexadecimal, binary, and octal.
SPRITE (#238) A graphics figure maker.

Utilities

BATCH FILE UTILITIES (#82) An excellent primer for neophytes-plus.
BACK SCROLL 6.4 (#129) A bi-directional scrolling utility.
DB SCREEN (#128) 'Paint' you dBASE II screens in a full screen edit mode.
DISKCAT 4.0 (#106) Catalogs all of you disk files.
FREECOPY (#266) A complete set of disk copy programs.
GINACO (#66) Lots of good stuff for the beginner.
QUICKREF (#59) Produces a function key template on your printer.
ULTRA-UTILITIES 4.0 (#133, #245) Recover lost files, edit bytes in files.
PC-COMPARE 1.24 (#113) Flexible ASCII file compare.
DEFKEY (#113) Changes multiple key functions to single key.
EASYRITE/LABLEFILE (#146) EasyRite is a unique word-processor and editor. LableFile is a highly flexible file-management and lable-print program.
SYSMENU (#250) Menu driven directory-mainly for hard disks.
DISKJOCKEY (#284) Allows reading of disk sectors and tracks.
AUTOMENU 2.0 (#284) Remembers you DOS commands.
LOAD-US (#284) Enables use of Lotus and Symphony on hard disk.
COLLST (#276) Prints columns in superior format.
FINDFILE 2.0 (#277) Finds a file.
ALIGN 1.6 (#217) Disk alignment tool.
TOP UTILITIES (#273) VDEL, MOVE, WHEREIS, RAMdisk, Spooler.
BASIC NECESSITIES V1.12 (#162) This disk is a must set of utilities for use with BASIC.
BASREF 3.1 (#60) A utility program to help in developing programs in MICROSOFT BASIC.
EXPLIST (#7) Performs a number of formatting functions as a program is listed.
CROSSREF (#8) Makes programming and maintenance jobs easier.
BPRINT (#236) BASIC program lister.
NUMZAP (#284) Removes line numbers from BASIC programs.
UNPROT (#2,#28,#67) To read protected ('P') BASIC programs.

File encryption

COMPUTER CRYPTOGRAPHY 1.53 (#112) Encodes data for confidentiality.
CONFIDANT (#230) Encodes data for confidentiality.

Printer utilities

SP 3.4 (#186, #275) A software printer buffer to hold data intended for the printer.
FASTPRT 2.0 (#59) A speed-up utility for the PrtSc function.
PC-FONT 2.04 (#225) Enables your Epson or IBM Graphics Printer to print all of the 256 possible characters.
PC-PRINT CONTROL (#250) Move control over your printer.
PRINTGR (#61) The two programs, Printgr1 and Printgr2 will produce printed copies of screen displays in eiter medium (320x200) or high (640x200) resolution mode.
PROWRITER (#220)
NEC 8023A (#221)
TRANSTAR 315 (#222)
VOLKSWRITER/TOSHIBA (#236) Toshiba printer controls for VW DeLuxe Graphics.
DESIGNER (#69) A BASIC Animation Programming Tool.
SLIDE (#244) Produce medium quality slides and overhead transparancies.

Computer Education

PC-PROFESSOR (#105) An excellent BASIC tutorial.
PC-DOS HELP (#256) Type 'help' for the DOS command you forgot.

Education

HISTORY (#76) A game that teaches American history.
PC-TOUCH (#249) A typing tutor.
EQUATOR (#249) A teaching tool for math, science and finance.

Games

FUNNELS & BUCKETS (#229)
Norland HANGMAN 4.1 (#153)
LIFE2 (#79)
TOP GAMES (#274) This disk is a must -all the best arcade type games.
SPACEWAR (#292)
Another collection of top Arcade games (#293).
EAMON (#296,#297) Adventure game compiler.

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PIANO MAN (#279) Lets you play your PC's keyboard like a piano.

Applications

PC-FLY 'FLITEPLN' 2.1 (#261) Prepare a flight plan
FT-ETC 1.25 (#240) A genealogy program.
GENEALOGY ON DISPLAY 3.0 (#90)
MAPMAKER (#219) A well-conceived set of mapping routines.
SAGE TAG (#243) Makes tags.
PERSONAL DATEBOOK (#261) Appointments, addresses, memos, etc.
SAGE CALENDAR (#243) Appointments, addresses, memos, etc.
RECIPE83 (#281) Recipe index, PC-FILE III format.
PC-GOLF 1.4 (#262) Analyze your golf score for problem areas.

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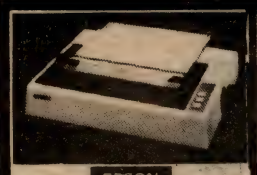

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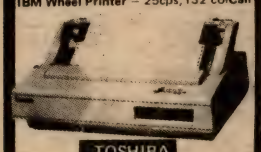

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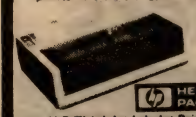

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H-P ThinkJet Ink Jet Printer
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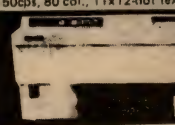

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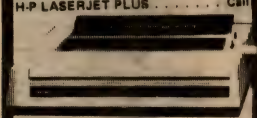

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6100 – 18 cps, 13" platen, 2K buffer, buffer, parallel. $379
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M-1509 – 180 cps, (45cps NLQ), 132 col., friction feed and the new push type pin-tractor so first form won't be wasted. IBM and Epson FX-100+ compatible. Very quiet operation. Dual interface . . . . . Call
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HR-25 – 23cps daisywheel, para $480
HR-35 – 36cps daisywheel, para $585
DM-40 – 160cps, 24-pin dot matrix, 136 col., with tractor, para . . $925

FORTIS – *by Brother*

Fortis 15XL – 17cps daisywheel printer w/3K buffer. Parallel . . $SALE!
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Fortis DX-25 – 25cps daisywheel, 132 column, 7K buffer, quiet operation, built-in parallel & serial. . . . . Call
Fortis DH45 – Dual head printer, 160 cps dot matrix, 36 cps daisywheel, Epson, Diablo compatible . . $999
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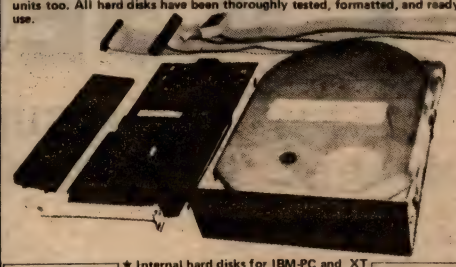

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$115 ea.
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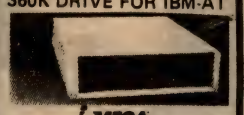

MEGA

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Bootable interface card. $229
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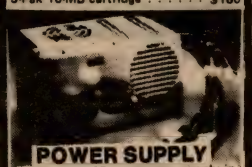

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Cards for IBM PC and XT w/Free Sidekick software

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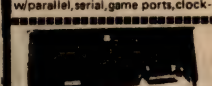
Memory installed on card	64K	128K	192K	256K	320K	384K
with parallel, serial ports & clock	$219	$229	$239	$249	$259	$269
above plus game port	$254	$264	$274	$284	$294	$304

ADVANTAGE CARD for AT 128K $399 256K $429 384K $459

MULTI-FUNCTION MEMORY CARD

Fully compatible with IBM-PC and XT. Comes with Ram disk and print spooler software.

Memory installed on card	0K	64K	128K	192K	256K	320K	384K
w/parallel, serial, game ports, clock	$139	$149	$159	$169	$179	$189	$199



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Hercules Graphic Card $299
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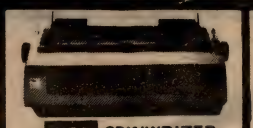
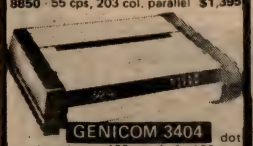
Paradise Modular Display Card . $285
Generic Color Graphics Card . . $125
Generic Monochrome Card . . . $135
Plantronic ColorPlus w/software $379
Intel Above Board . . . . . Call
Orchid PC Turbo 186 w/256K . $695
Orchid PC Turbo 186 w/640K . $775
Sigma 400H Color for PGS SR-12 $499
Sigma 400L Color for Taxan 440/630/640 monitors $499
Taxan 555 Hi res. color card. . . $225
Persist BOB Board – Ultra hi res. color card. Ideal for Taxan 630/640 $389
Tecmar Graphic Master. $495
Everex Graphic Edge $399
PC Peacock Color Card. $279
AST Preview graphics w/para. . . $299
Parallel Printer Card – Half size. . $69

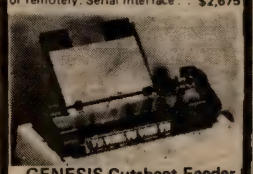


NEC SPINWRITER

3550 - 33 CPS, 203 col., proportional space, bi-directional, parallel. $995
2050 Similar to 3550 but 19 cps $625
8850 - 55 cps, 203 col. parallel $1,395



GENICOM 3404 dot matrix printer. 400 cps draft, 100 cps letter quality, 136 column, tractor feed. Digital display, programmable locally or remotely. Serial interface . . $2,675



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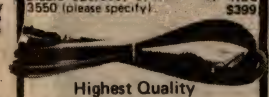
Single bin feeder, mechanically driven for high reliability --no electronics, no motor. Easy installation Available for Diablo 620/630, C. Itoh F-10, NEC 3550 (please specify) $399



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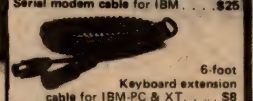

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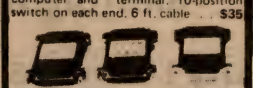
Solve the handshaking problem between computer and terminal. 10-position switch on each end. 6 ft. cable . . $35



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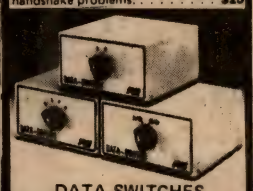

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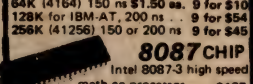
64K (4164) 150 ns $1.50 ea. 9 for $10
128K for IBM-AT, 200 ns . . 9 for $54
256K (41256) 150 or 200 ns 9 for $45



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Intel 8087-3 high speed math co-processor . . . $135
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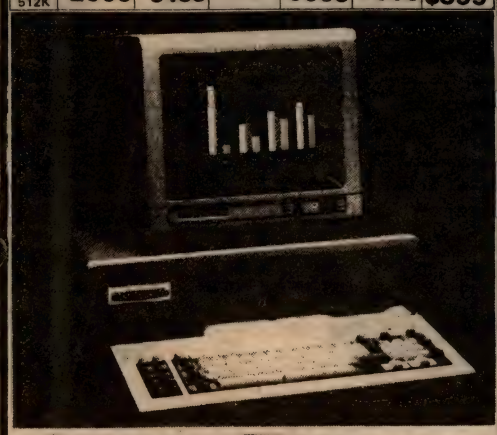
AT 512K	$2995	$3195		$3995	$4395	avail w/1 dr. $899



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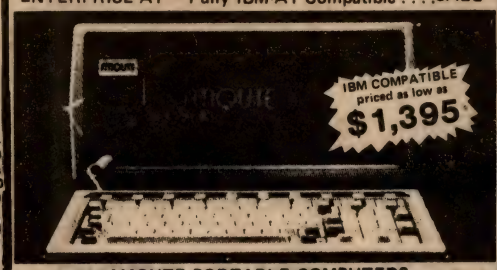

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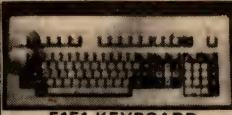

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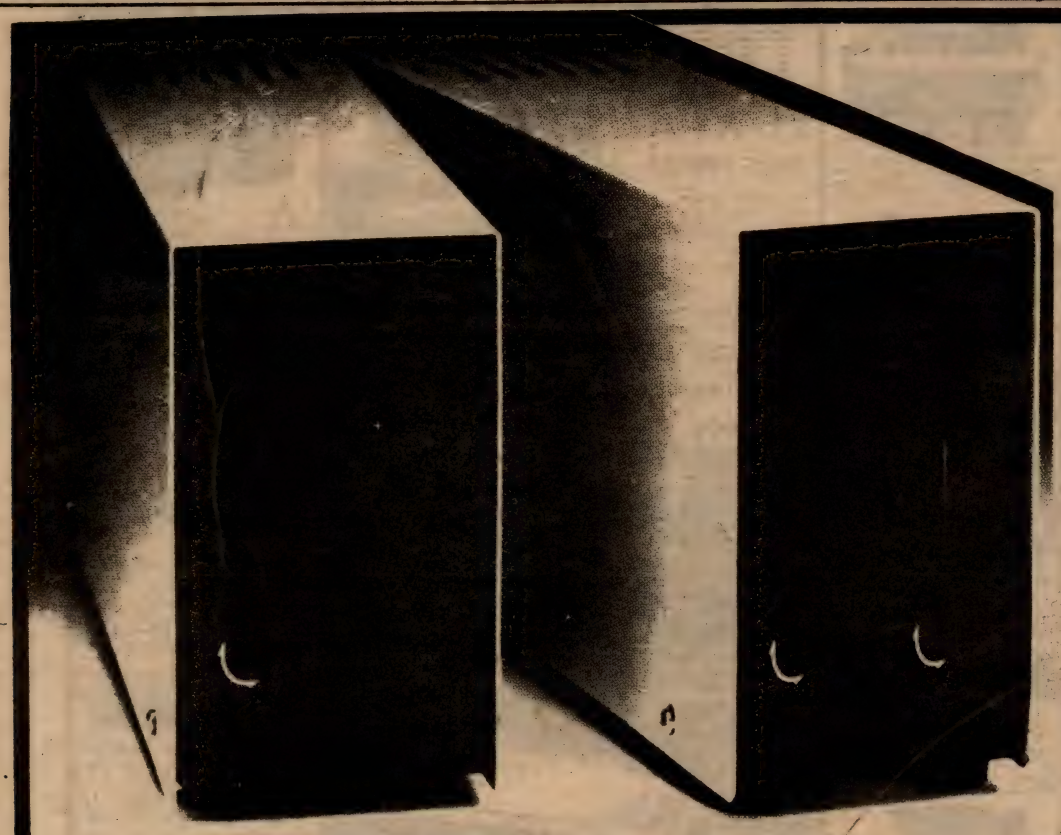

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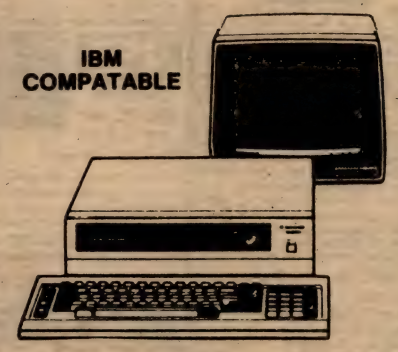

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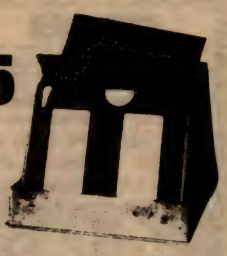

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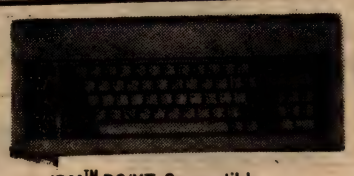

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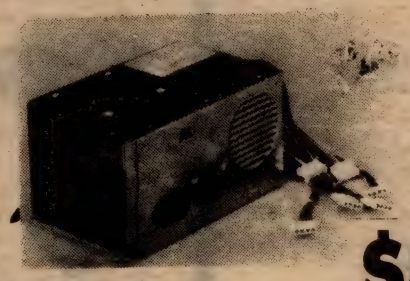

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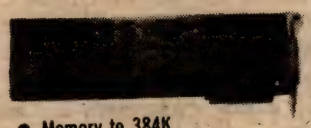

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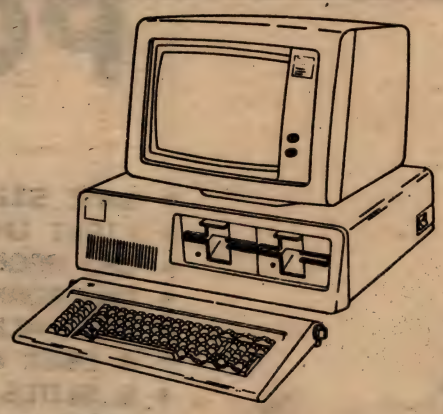

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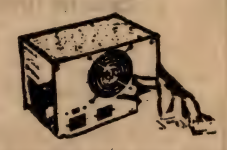

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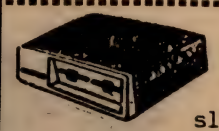
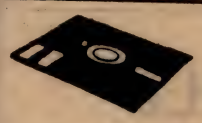
5151 style.....$119.00
PC-AT look-alike.....$ 99.00



PC ADD ONS...MISCELLANEOUS:

slide-out or flip-up case.....$ 59.00
Western Digital hard-disk controller/cable....$149.00
joystick.....$ 21.95
parallel printer cable.....$ 11.95
modem cable.....$ 13.00
mouse system w/PC Paint or PC Paintbrush.....$139.00

HIGH PERFORMANCE...LOW PRICE...GREAT SOFTWARE!



AND MORE TO COME...

PAPERBACK SOFTWARE, INC.

NumberWorks.....$39.95
Executive Writer.....$69.95
Paperback Writer.....$39.95
My ABC's (3-7 yrs).....$19.95
Draw It.....$29.95
Executive Filer.....$49.95
Paperback Speller.....$39.95
VP-planner.....$99.95

DAC SOFTWARE, INC.

DAC Easy Accounting...(7 powerful, integrated packages).....$69.95

DATADISK

96TPI drive software...(run 96 track drives).....$39.00

HYPERGRAPHICS CORPORATION

Ole On-Line Encyclopedia for DOS Users.....$69.95
(throw away your manual...great for learning...better for resident on-line reference)

Ole BASIC (combination tutorial and reference system).....$69.95

****** USED EQUIPMENT ******

Eagle III PC	$ 500.00
Big Board with 8" drives	$ 350.00
North Star 8080 CPU/Esprit terminal	$ 500.00
Kaypro II system	$ 550.00
Kayrpo IV system	$ 650.00
Radio Shack Model I	$ 400.00
Radio Shack color computer	$ 200.00
TRS Model 2 computer	$ 450.00
TI 99/4A disk drive	$ 159.00
Silent 700 KSR terminal	$ 129.00
IBEX 2200 system	$ 450.00
Morrow Design CP/M system	$ 600.00
Micro Processor CP/M-86 system	$ 450.00
RB5X robot (complete)	$ 900.00
TRS-80 Line Printer II	$ 200.00
COMPAQ DESK PRO 2...(ALMOST NEW!!!) with Epson FX100+ printer	$2400.00

CONDITIONS & GUARANTEES VARY. MANY SYSTEMS INCLUDE LOTS OF SOFTWARE! ALL ARE SOLD ON A FIRST COME BASIS.

DISK DRIVES: NEW:

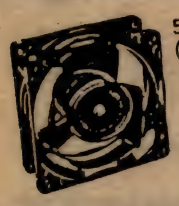
Qume half-height double side	$ 59.95
Shugart 455 96TPI double side	$ 99.00
10 Meg half-height hard disk	$279.00
20 Meg half-height hard disk	$425.00
10 Meg Shugart 8" 220V/50Hz	$ 75.00

MANY EXCELLENT USED AND REFURBISHED HARD DISK AND FLOPPY DISK DRIVES IN STOCK

WE MAKE CUSTOM CABLES! CALL FOR QUOTE.

RUNNING MS-DOS, Second Edition by Van Wolverton, THE book on the standard operating system is out and we have it in stock.....$19.95

RESISTORS / CAPACITORS / SWITCHES / TERMINAL BLOCKS / PARTS / COMPONENTS



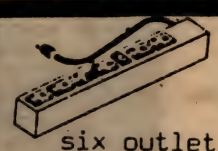
5" muffin fan 120V AC (deinstalled equipment)
$4.95

Sprite fan 115V 3½"
$4.00

VOLTAGE REGULATORS

7805T = 5V
7812T = 12V
7815T = 15V
7824T = 24V

45¢



$14.00
six outlet
AC SURGE SUPPRESSOR

RAM CHIPS

64K/150ns	$ 7.50/set-9
128K	$36.50/set-9
256K	$32.00/set-9

CANON PRINTERS!

Mdl 1080A (80 col)	$219.00
Mdl 1156A (wide carriage)	$349.00

* 160 cps * self-test mode
* parallel interface
* near letter quality (27 cps)
* friction or sprocket feed
* bi-directional printing (2K buffer)
* full Epson character set, including graphics

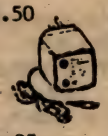
MOVIT!! UNIQUE DO-IT-YOURSELF EDUCATIONAL ELECTRONIC ROBOT KITS!

TURN BACKER	sound sensor	34.95
AVOIDER	infra-red	39.95
LINE TRACER	infra-red	34.95
PIPER MOUSE	sound sensor	39.95
PEPPY	sound/touch	21.95
SOUND SKIPPER	sound activated	21.95
MR. BOOTSMAN	wired control	29.95
CIRCULAR	remote control	62.95
S-CARGO	sound sensor	34.95
NAVIUS	programmable disc	44.95
MEDUSA	sound activated	24.95
WAO	programmable conditional calls sub-routines, written graphics	89.95

POWER SUPPLIES:

Fox AC adaptor
input 117V AC
output 12V AC 600 ma
.....

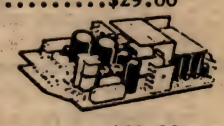
Atari power supply modules
output is 9V @ 150 ma
.....$2.50



18V AC supply 4½ x 4 x 1
+ 5V @ 1.2A
+12V @ .5A
- 5V @ .3A
.....$4.95

Scrap 18 x 5½ x 7 powerhouse
+5V & +12V includes:
fan, AC & DC breakers,
voltage adj. pots
.....$6.00

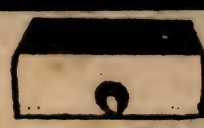
Astec supply 6½ x 5½ x 4
input voltages: 115/230V AC
+ 5V @ 6A
+ 9V @ 1.5A
+12V @ 2A
+17V @ 1.5A
+34V @ 2.25A
complete with cooling fan!
.....$29.00



DC power supply
+ 5V @ 5A
+12V @ 2.8A
-12V @ 2.5A
.....$29.00

Diskdrive supply
+ 5V @ 4A
+12V @ .8A
-12V @ 8A
-12V @ .3A
.....$24.95

Signalman Mark XII modem	$299.00
Diskette storage boxes...75 unit	$ 8.49
..100 unit	$ 13.49
diskettes (box of 10)	$ 10.00
disposable head cleaner diskettes (10/pkg)	$ 9.95
8" drive case kits	$ 39.00
numeric keypads w/serial output	$ 4.25
empty modem boxes (10 x 8½ x 3)	$ 2.95
3-prong AC cables for PC-monitor	$ 1.89
fuse/switch assemblies w/3-prong AC plug	$ 1.50
edge connectors bus 100 connectors	$ 2.00
86 pin connectors	$ .75
70 pin connectors	$ 1.60
terminal strips: 4,6,8,10,12,15 position	$ .59
rubber feet...4/strip	$ .49
RS232 25 pin, 6 foot extension cable	$ 11.95



AB SWITCH BOXES
$39.00
RS-232
serial & parallel

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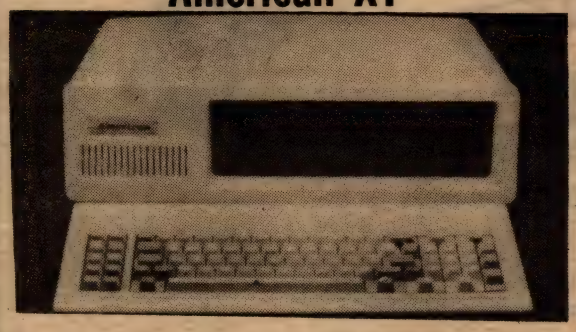
- VISA & MasterCard add 3%
- COD's add $1.90
- Checks accepted, allow 10 days to clear
- Dallas MTA add 6 1/8%
- Other Texas residents add 5 1/8%
- Prices subject to change without notice
- We reserve the right to limit quantities

VISA
master charge
AMERICAN EXPRESS

American XT



American XT Personal Computer

American XT Computer System Unit

Highlights Include:

- 256KB user or random access memory (RAM) standard...expandable up to 1MB on the system board (640KB DOS accessable).
- 8KB permanent or read only memory (ROM), which contains the BIOS and 56KB user usable.
- High-performance, high-speed, 16-bit 8088 microprocessor.
- Eight expansion slots that allow easy system expansion by using optional plug-in adapters.
- Two 360KB slim line diskette drives to support single-sided or double-sided, double-density, 5¼ inch diskettes.
- Optional 10MB or 20MB fixed disk drive.
- 135W power supply 110V/220V switchable.
- Four layer mother board to increase system reliability.
- Speaker for audio and music applications.
- Power-on automatic self-testing of system components.

Keyboard

American XT computer comes with a slim, lightweight keyboard. It features:

- An 84-key, typewriter-like format to help make it easy to learn and operate the system.
- A six-foot coiled cable that allows convenient movement of the keyboard.
- Power, caps-lock and num-lock LED indicators.
- A 10-digit, calculator-like numeric keypad for entering numbers quickly and easily.
- 10 special function keys to save time in activating commonly repeated tasks.
- A special "print screen" key that enables you to print out anything that appears on your display screen at any time.
- Typing angle can be adjusted to suit your working position.
- Optional enhanced keyboard with separated cursor and numeric keypad.

Hardware Specifications:

Size: width—20", depth—16", height—5.5".
Weight: without diskette drive—21 lbs; with two drives—28 lbs; with hard disk—33 lbs.
User Memory: cycle time—410 nanoseconds; access time—250 nanoseconds.
Environment: air temperature—60°F to 90°F system ON, 50°F to 110°F system OFF; humidity—8% to 80% system ON, 8% to 80% system OFF; noise levels-59dB (without printer); electrical—120V/220V AC, 60/50 cycles, 200 watts.

Software.

Runs all the popular programs written for the IBM PC/XT using the MS-DOS version 2 operating system.

System Specifications:

- **Model 1, Basic System.**
  - ☐ **256K bytes random-access memory (RAM).**
- **Model 2, Office System.**
  - ☐ 256K bytes random-access memory (RAM).
  - ☐ Two diskette drives with controller.
  - ☐ Color graphics card or monochrome card.
- **Model 3, Business System.**
  - ☐ 640K bytes random-access memory (RAM).
  - ☐ Two diskette drives with controller.
  - ☐ I/O plus with serial, parallel, game port and battery backup real time clock.
  - ☐ Color graphics card or monochrome card.
- **Model 4, Professional System.**
  - ☐ All the features of model 3 plus a 10MB fixed disk drive.
- **Model 5, Executive System.**
  - ☐ All the features of model 3 plus a 20MB fixed disk drive.

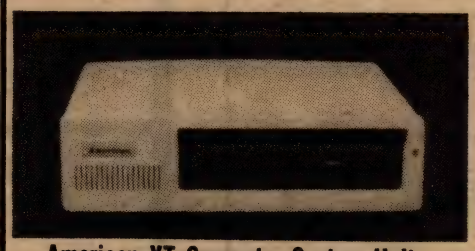
Introducing the most

COMPATIBLE & AFFORDABLE

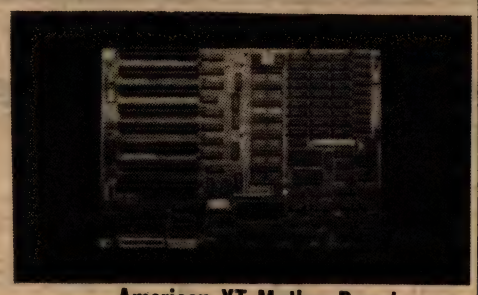
Desktop Computer

American XT/AT

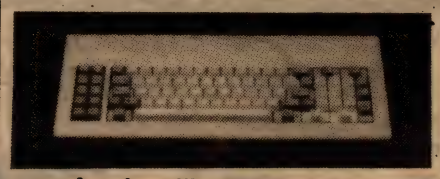
The Perfect Solution



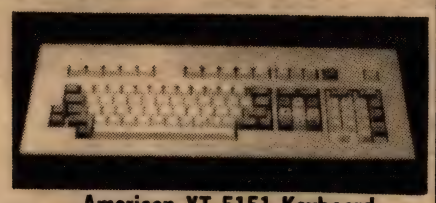
American XT Computer System Unit



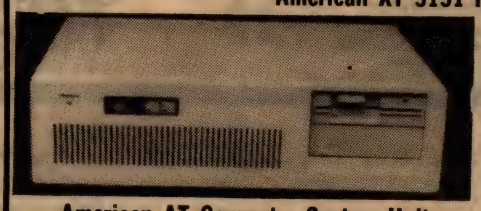
American XT Mother Board



American XT 5150 Keyboard



American XT 5151 Keyboard



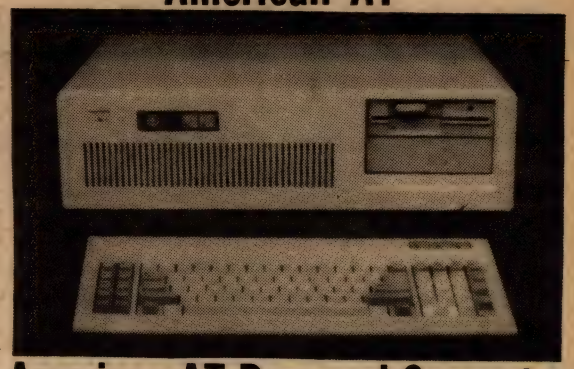
American AT Computer System Unit

Regional Distributors & OEM

Inquiries Welcome

Manufactured by:

American AT



American AT Personal Computer

American AT Computer System Unit

Highlights Include:

- 512KB user or random access memory (RAM) standard...expandable up to 4MB by adding memory feature cards.
- 64KB permanent or read only memory (ROM), which contains the BIOS.
- High-performance, high-speed, true 16 bit 80286 microprocessor.
- Eight expansion slots that allow easy system expansion by using optional plug-in adapters.
- 1.2M high capacity disk drive to support 5¼ inch diskette.
- 200 watts power supply 110/220V switchable.
- Battery backup for CMOS configuration table and real-time clock.
- 7-channel direct memory access (DMA).
- 16-level interrupt.
- Three programmable timers.
- Speaker for audio and music applications.
- Power-on automatic self-testing of system components.

Keyboard

American AT computer comes with a slim, lightweight keyboard. If features:

- An 84-key, typewriter-like format to help make it easy to learn and operate the system.
- A six-foot coiled cable that allows convenient movement of the keyboard.
- Cap-lock, num-lock and scroll-lock LED indicators.
- A 10-digit, calculator-like numeric keypad for entering numbers quickly and easily.
- 10 special function keys to save time in activating commonly repeated tasks.
- A special "print screen" key that enables you to print out anything that appears on your display screen at any time.
- Typing angle can be adjusted to suit your working position.

Hardware Specifications:

Size: width—21.3", depth—17.3", height—6.8"
Weight: without diskette drive—33 lbs.; with one drive—37 lbs.; with hard disk—42 lbs.
User Memory: cycle time—275 nanoseconds; access time—150 nanoseconds.
Environment: air temperature—60°F to 90°F system ON, 50°F to 110°F system OFF; humidity—8% to 80% system ON, 8% to 80% system OFF; noise levels-59dB (without printer); electrical—120V/220V AC, 60/50 cycles, 300 watts.

Software.

Runs all the popular programs written for the IBM PC/XT using the MS-DOS version 3 operating system.

System Specifications:

- **Model 1, Basic System.**
  - ☐ 512K bytes random-access memory (RAM).
- **Model 2, Office System.**
  - ☐ 512K bytes random-access memory (RAM).
  - ☐ One diskette drive with controller.
  - ☐ Color graphics card or monochrome card.
- **Model 3, Business System**
  - ☐ 512K bytes random-access memory (RAM).
  - ☐ One diskette drive with controller.
  - ☐ Serial/Parallel interface card.
  - ☐ Color graphics card or monochrome card.
- **Model 4, Professional System.**
  - ☐ All the features of Model 3 plus a 20MB fixed disk drive.
- **Model 5, Executive System.**
  - ☐ All the features of Model 3 plus a 40MB fixed disk drive.

American Computer & Peripherals, Inc.

2134 S. Ritchey St., Santa Ana, CA 92705

Tel: (714) 545-2004 - Sales (714) 545-2098 Service

American ADD-ON

American Color Graphics Card

- Use state-of-the art technology GATE ARRAY LOGIC to increase reliability and reduce cost.
- RGB and composite outputs with 640 x 200 pels compatible to IBM standard.
- Light pen and RF modulator interface standard.

American Monochrome Card

- Use state-of-the-art technology GATE ARRAY CHIP to increase reliability and reduce cost.
- TTL output 720 x 350 pels with 25 lines x 80 column compatible to IBM standard.
- Built-in parallel printer port.

Floppy Controller Card

- Can control up to 4 drives.

Monochrome Graphics Card

- TTL Output 720 x 350 pels with 25 lines x 80 column for text mode.
- 720 x 348 pels in Graphics mode compatible to Hercules card.
- Built in parallel printer port.

I/O Plus Card

- Serial, parallel, game ports and real time clock.
- 2nd serial port optional.

Multifunction Card

- 384K RAM Sockets.
- serial, parallel, game ports and real time clock.
- With RAM Disk and PSPOOL software.

Hard Disk Controller Card

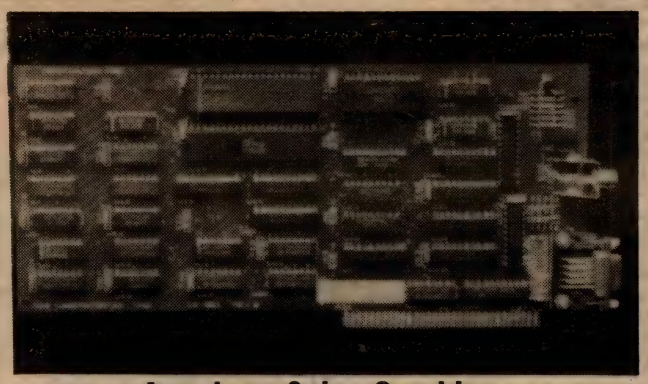
- Control up to 2-20M hard disk

Serial/Parallel for AT

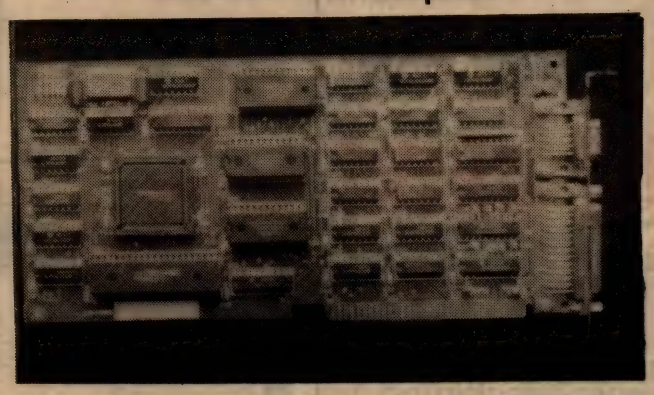
- Serial and Parallel Interface card for AT.

Controller Card for AT

- Control 2-1.2M floppy disk drives.
- Control 2-20/40M hard disk drives.



American Color Graphics



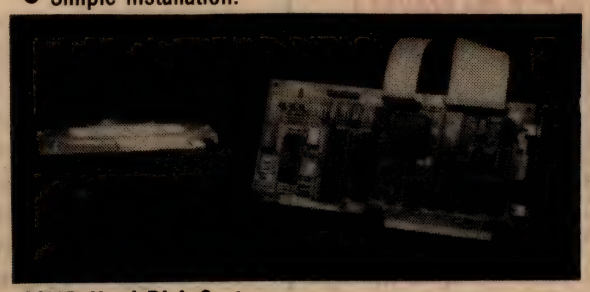
American Monochrome

American HD

American Hard Disk System

10MB Hard Disk System:

- Formatted and tested.
- Slim line hard disk with controller card.
- Simple installation.

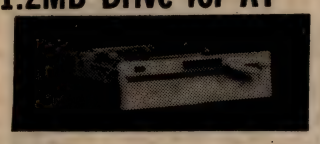


20MB Hard Disk System:

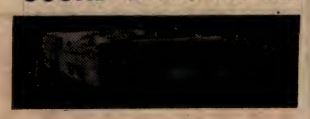
- Formatted and tested.
- Full size panel with controller card.
- Simple installation.

20MB Hard Disk for AT

1.2MB Drive for AT



360KB Drive for AT



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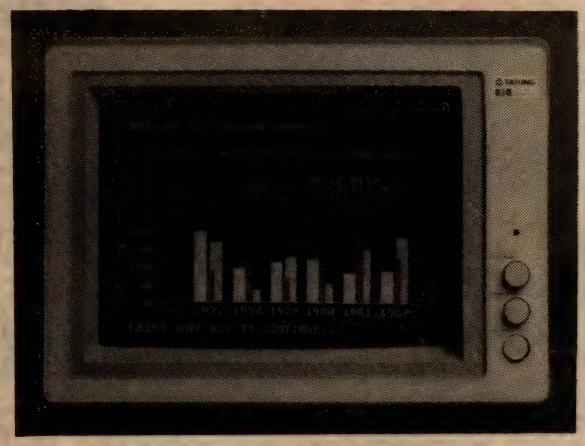
American Monitor



CM-1322

- 13" RGBI color monitor for separate TTL-signal-output personal computer.
- High performance 16 color display, fully compatible with IBM.
- Switching mode power supply for wide range power input low power dissipation.
- Lock type controls on front-panel.
- Dark tinted CRT.

American Modem

American Modem 1200B

- Free PC-Talk Software
- Additional RS232 Serial Port Included.
- Voice and Data jacks with keyboard switching.
- Intelligent-Adaptive-Auto Speed Dial.
- 300/1200 Baud Bell 103/212A.
- Self test at power up.
- Auto redial on busy.
- Call progress monitoring.
- Fully Hayes compatible with enhanced features.

American PS

- 130W/150W Power Supply for IBM PC upgrade. Same dimension as IBM PC.
- 200W Power supply for AT system. Same dimension at IBM AT PS.

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PC System Design
Pasadena, CA (818) 792-8889
Ascot Engineering, Inc.
Edmonton, Canada (403) 438-0994
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Brooklyn, NY (718) 941-2512
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HEXPACK*** A workalike copy of the famous AST SIX-PACK , WITH UP TO 384K RAM, Clock, Calendar and Serial and Parallel ports. 100% IBM and AST compatible, complete with schematic, parts placement and assembly data.....$29.95
Optional complete manual and software diskette.....$8.95

MONTE CARLO CARD*** One of the best multifunction cards we have ever seen. This one takes either 64K or 256K RAMS in any combination for up to 1 Mbyte on board. (640K DOS accessble, balance subroutine accessed) PLUS two game ports, Clock, Calendar and Serial and Parallel ports. Clearly an awe inspiring array of functionality on a single card. Complete with schematic, parts list and placement diagram.....$34.95
Optional complete manual and diskette.....$8.95

COLOR GRAPHICS CARD*** A workalike copy of the popular PERSYST color graphics card. 100% true to original and 100% compatible to IBM std. With assembly data.....$24.95

MONOCHROME GRAPHICS*** A workalike of the IBM mono card 100% compatible, with all assembly data.....$24.95

MONOCHROME GRAPHICS*** A workalike copy of the very nice HERCULES mono card, with static RAM on board. With all assembly data.....$29.95

DISC CONTROLLER*** A ¼size card for the short slot and portable use. 100% compatible, 1-4 drives complete with assembly data.....$19.95

DISC CONTROLLER*** A ½sized card for regular slot that is 100% compatible, runs 1-4 drives.....$14.95

DISC CONTROLLER +GAME I/O. A very compact ⅓ sized card that has two game ports and runs 1-4 drives. 100% compatible with all assembly data.....$19.95

MULTIFUNCTION CARD** The older style with only 256K RAM On board with Serial, Parallel ports, Clock, Calendar. A very good style card on sale while they last, this is a copy of the earlier AST 256K multifunction cards. Complete with all assembly data.....$19.95

384 RAM*** RAM only in close array, 384K of 64K RAM ideal for economy enhancement of system capacity. With all assembly data.....$19.95

512K CARD*** Another very economical expansion card. Takes 64K RAM In close array. With all assembly data.....$24.95

KRAM CARD*** We took a 512K card and rewired it for 256K RAMS. It now has four times the memory or 2 MBYTES. It closely follows the function of the popular JRAM card as all this type do, and also shares partition ing parameters to the extent that it will run the JRAM software or other similar programs. RAM Disc Drives are very easy to delineate. With all assembly data.....$34.95

PROTOTYPE CARD. 100% WW holes with DB-25 and DB-9 footprint on end.....$24.95

MEMORY PROTOTYPE CARD. This unique card has a memory array at one end. 36 16 pin sockets are placed in copper on board with all bussing in common, but with CAS, RAS etc brought out row by row and column by column so that either 64K or 256K RAMS can be quickly wired in. A 0.1 bypass cap is on each IC as well. The remaining ¾ of the board is 100% WW holes with a DB-25 and DB-9 footprint on one end.....$24.95

EXTENDER CARD. When you need to service a card with power on it is very hard to get at the board to trace signals etc so we made this little gem that lifts the whole thing up by about 6" for easy access.....$19.95

A ¼ size card with two serial ports on board.....$14.95

PARALLEL PRINTER CARD. A ¼ size card with a complete IBM std centronics printer porton board, with all data.....$14.95

GAME CARD. A ¼ sized card with two game ports.....$14.95

DISC CONTROLLER + PRINTER CARD. Runs a parallel centronics printer and 1-4 drives. With all data...$24.95

PIA CARD. A fully locatable dual port PIA card. The two ports are DIP Switch programmable anywhere....$19.95

PIA + PROTOTYPE CARD. Same as above by a full sized card with WW holes and DB-25 and DB-9 footprint.....$24.95

COMPUTER PARTS GALORE INC

56 HARVESTER AVENUE, BATAVIA, NY 14020

1-800-431-9008

NEW YORK RESIDENTS (716) 343-6133
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TERMS: Minimum order is $10. For orders less than $60. add $5 shipping & handling for UPS Ground delivery or $10 for UPS 2nd day air. Orders over $60. add 5% for shipping & handling for UPS ground. 10% for 2nd day air. COD orders add $2.50 to above fees. New York residents add proper sales tax. COD payment must be cash, certified check or money order. Phone and mail orders can pay by Visa, MasterCard, Amex., or COD. We accept personal checks with mail orders, but allow two extra weeks for processing.

master charge VISA

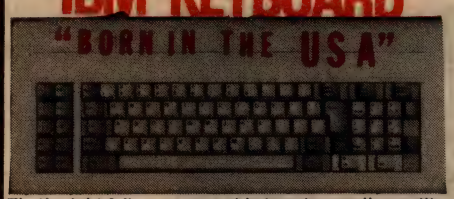
HARD DRIVE

SWITCHING 75 watt SUPPLY

+5VDC @ 5.5A +12VDC @ 4A −12VDC @ 0.3A

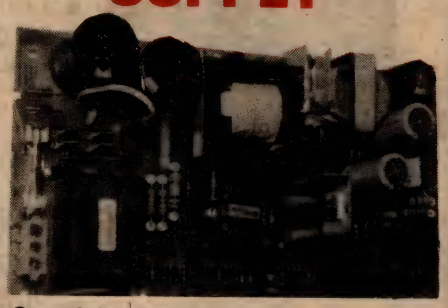
GREAT BUY ONLY $44.00

KEYTRONICS 5150
IBM KEYBOARD



That's right folks, we were able to get a small quantity of genuine KEYTRONICS 5150 BRAND NEW US made IBM type keyboards for a really low-low price. However they will only last for a few short weeks so order right now as we want ot move them real fast at only...$79.95

IBM POWER SUPPLY



One of the nicest open frame IBM type switching power supplies we have ever seen. Came from the defunct NCR IBM compatible, runs the whole thing, has +5V-7A, +12V-3A, -5, -12-¼A. A very good unit for starter system.

a real Steal at.....$39.95

MBE-XT
AN IBM® XT COMPATIBLE 8 SLOT MOTHERBOARD

MBE-XT BARE PCB WITH MANUAL AND SCHEMATICS.

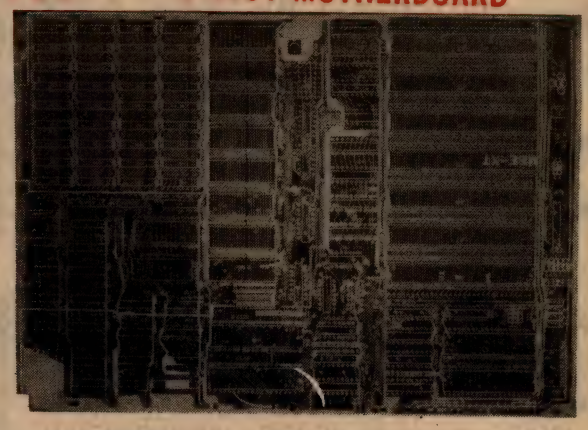
$39.95

LAZY BOARD

What is your time worth?? We have had a bunch of MBE-XT boards stuffed and wave soldered so you can save all that time soldering them up. All you need are the IC's memory, and BIOS and you are set to go $159.00

FULLY WIRED AND TESTED WITH 64K ON BOARD WITH MEGABIOS AND MANUAL

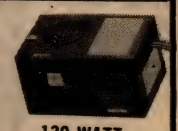
$295.00



- 8088 16 BIT MICROPROCESSOR
- 8087 MATH PROCESSOR, OPTIONAL
- UP TO 256K DRAM ON BOARD
- HAS DIGITAL DELAY LINE FOR ERROR FREE MEMORY REFRESH
- 8 IBM COMPATIBLE EXPANSION SLOTS
- 4 DMA AND TIMER CHANNELS
- 64K/128K EPROMS JUMPER SELECTABLE
- WILL RUN ANY COMPATIBLE BASIC
- IBM POWER PLUG COMPATIBLE
- SAME PCB SIZE AS IBM XT
- RUNS PC-DOS AND CPM-86
- COMPATIBLE BIOS IN STOCK

SWITCHING POWER SUPPLY $99.00

Exact fit to our PC/XT case

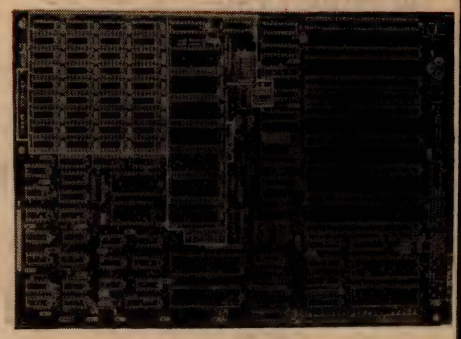


130 WATT
+5V. @ 15 AMPS
+12V. @ 4.5 AMPS
+5V. @ 0.5 AMPS
−12V. @ 0.5 AMPS

4 Drive Connectors

NEW—640K
100% COMPATIBLE
IBM-XT Compatible
WIRED AND TESTED 8 Slot Motherboard

* 8088 16 BIT MICROPROCESSOR
* 8087 MATH CO-PROCESSOR*OPT
* UP TO 640K DRAM ON BOARD
* 8 IBM COMPATIBLE EXP SLOTS
* 4 DMA AND TIMER CHANNELS
* WILL RUN ANY COMPATIBLE BASIC
* IBM POWER PLUG COMPATIBLE
* SAME SIZE AS XT MOTHER BOARD
* RUNS PC DOS AND CPM 86
* COMPATIBLE BIOS IN STOCK



We have worked and sweated over the MBE-XT board and have found a way to modify it and to take 256K RAMS so that you can use 2 rows of 256K and 2 of 64K to get a total of 640K of DOS viewed memory (Up to 1 Mbyte with special software). It has all the features of the MBE-XT plus the extra RAM and the size is exactly the same as the XT motherboard with all the same slot and hole spacing to fit our cases listed on this page and take the power supplies we sell as well. Of course it costs a tiny bit more, but $10.00 is worth if for the extra RAM.

WIRED OK RAM

$179.95

WIRED NO IC's (LAZY BOARD)

$99.95

SPECIAL $49.95

ONLY $29.95 WITH OUR CASE

HD SWITCHING POWER SUPPLY

185Watts, MADE IN THE USA by POWER ONE. This unit is BRAND NEW, NEVER USED, TESTED and very HEAVY DUTY. Fully enclosed, 13x5x2.5" with Push-on and screw terminals.....$49.95

+5V-25A
+12V-3.5A
−5V-1.0A
−12V-1.0A

IBM CASE

$59.95

We have the nicest case of all the various competing cases, ask any friend who has bought someone else's case and then has seen ours. The lid is hinged with pushbutton access. The back is cut for 8 XT slots and it comes with all the case back inserts for cards, card guides, blind disc filler plates, standoffs, feet, screws, all for $59.95

Please specify back or side cutour for power supply.

We also have an IBM 8 Slot/6502 Board dual duty case for making IBM look-a-like 6502 systems.....$79.95

MEGABOARD CASE, similar to the above, but no pushbuttons or hardware, from DTC in Dallas Texas. A stronger US made case, but less finishing parts. Fits the MEGABOARD exactly with side cut extender, for back power supply.....$69.95

SWITCHING POWER SUPPLY

Another great bargain from PARTS GALORE, A small power supply switching style that give +5v-4A; ±12v 1A and -5v (adjustable) on a compact 4x8" open frame PCB. Cost Northern Telecom $50.00 when they bought 5000 pieces. We got em when a subcontractor went belly up for 10% of that price and we are selling em for

$18.95 NEW IN BOX TESTED

AC power cable (3 Wire) for above.....$2.50

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56 HARVESTER AVENUE, BATAVIA, NY 14020

1-800-431-9008
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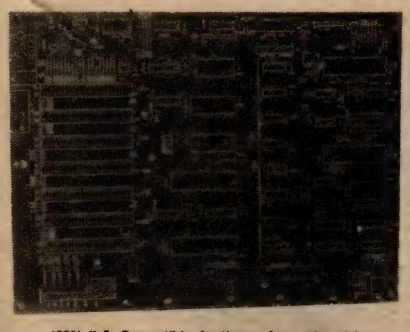
APPLE IIE® DETACHED KEYBOARD

A GEM of a keyboard, in a nice beige ABS case. Lets you build an IBM look-a-like that runs like a IIE with 2 drives in case using our $69.95 case on this page. This KB is fully IIE compatible, with all functions.....$149.95

MOTHER BOARD

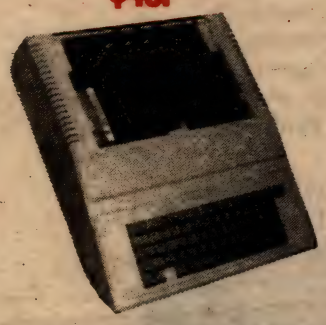


100% IIe® Compatible, for those of you who wish to build a clone of the very popular APPLE IIe® . This board is a reverse engineered copy of the IIe® and is 100% compatible. We have the motherboard and the custom ICs only. All other parts are widely sold. The custom ICs are workalike chips that do not infringe any copyrights. The software for operating the board must be obtained elsewhere as we do not have it for sale. When we say 100% we mean it.

A very good buy at $49.95
Custom IC set(2) $49.95
Keyboard encoder (AY3-3600) $14.95
Character generator, U/LC $14.95

IIe® ABS PLASTIC CASE

$49.95



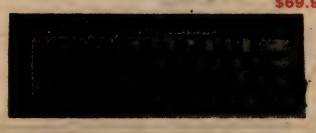
This case is made to fit the Mother Board listed here for making IIe® clones and it makes a very nice looking copy. There is just enough difference to avoid design infringement. The case also has no brand names or other marks on it.

A good buy at $49.95

IIe® MATRIX KEYBOARD

$69.95

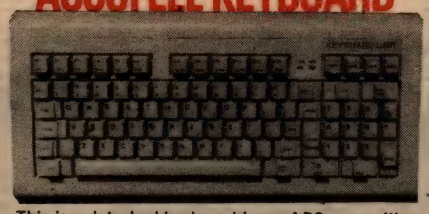
This keyboard fits the above case and has 100% clone compatibility, it will allow operation of all IIe® commands. Another bargain at $69.95



The famous APPLE-SEED and APPLE-SEED II are the books that see all, tell all on the various APPLE clone motherboards and peripherals. They are well worth the $12.95 that we are asking. And KOSMIC has been at it again on IBM clone motherboards and peripherals and has composed the one and only "BIG BLUE SEED", it goes into greater detail on a smaller number of motherboards and peripherals (over 20 and growing) and will help you to build many of them at a saving.

APPLE-SEED I Motherboard book.....$12.95
APPLE-SEED II Peripheral card book (over 75 cards).....$12.95
BIG BLUE SEED IBM peripherals and motherboards (over 50) $14.95

MAK II ACCUFEEL KEYBOARD



This is a detached keyboard in an ABS case with a 6" curly cord to connect ot to 6502 based machines. It used a serial data format for error free transmissions down the curly cord with a serial to parallel to converter board on the end that is fully 6502/ Apple compatible. Has auto repeat, beep, no beep. 10 user programmable macros, 50 preprogrammed macros, auto line number.

.....$149.95
FRANKLIN COMPATIBLE

PARTS

100Ns delay line	$6.95	0.1 Mono caps, 0.2"	$0.10
7 Ns delay line	$9.95		
62 Pin edge conn	$2.00	0.1 Mono caps, 0.1"	$0.12
50 Pin edge conn	$1.50		
5 Pin DIN conn	$1.50	50 Pf trimcap	$0.75
8 Pos DIP switch	$1.00	2-3" speaker	$1.50
MEGABOARD reset Sw.	$2.49	RCA jack, PC type	$0.49
4.7Kx6 SIP	$0.69	APPLE power set	$3.50
4.7Kx8 SIP	$0.99	6 pin row power set	$1.49
1Kx7 SIP	$0.59	square power set	$2.49
1KX8 SIP	$0.59	MPSA13	$0.49
2.2Kx9SIP	$0.79	2N4258	$0.75
10Kx9 SIP	$0.79	2N3904	$0.29
33 Ohm DIP	$1.49	2N3906	$0.29
4.7K DIP	$1.49	2N2222	$0.35
		2N2907	$0.39
		MPSU51	$1.00

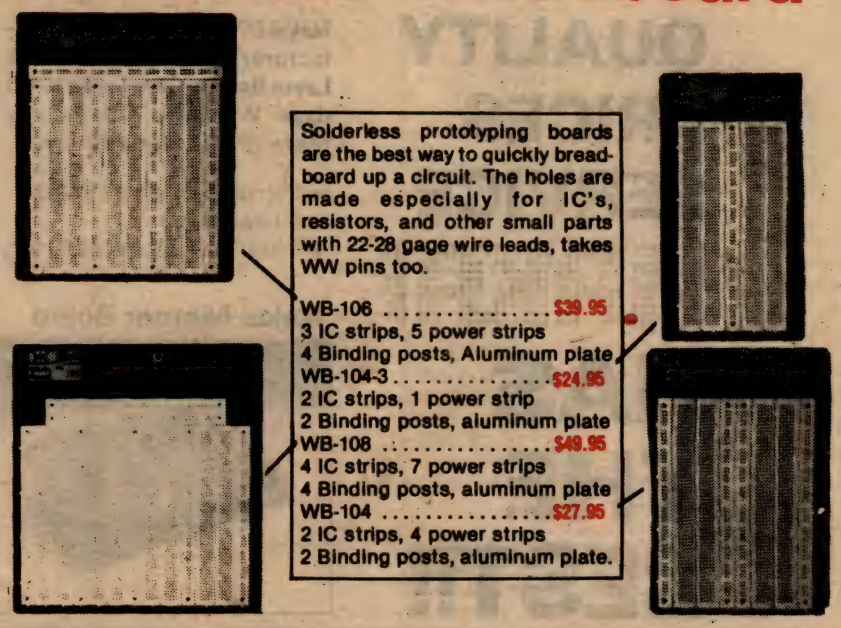
HARD DRIVE CABINET

$69.95

MADE FOR TWO ½ HEIGHT DRIVES
SPACE FOR POWER SUPPLY, FAN ETC.

40 WATT POWER SUPPLY..$40.95
60 WATT POWER SUPPLY..$60.95

Solderless Breadboard



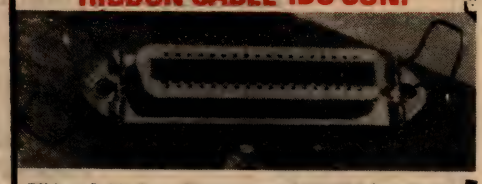
Solderless prototyping boards are the best way to quickly breadboard up a circuit. The holes are made especially for IC's, resistors, and other small parts with 22-28 gage wire leads, takes WW pins too.

WB-106 .....$39.95
3 IC strips, 5 power strips
4 Binding posts, Aluminum plate
WB-104-3 .....$24.95
2 IC strips, 1 power strip
2 Binding posts, aluminum plate
WB-108 .....$49.95
4 IC strips, 7 power strips
4 Binding posts, aluminum plate
WB-104 .....$27.95
2 IC strips, 4 power strips
2 Binding posts, aluminum plate.

Disc Doubler

DISC DOUBLER..... $5.95

CENTRONICS RIBBON CABLE IDC CON.



Ribbon Cable Type Centronics and DB-25 Connectors

DB-25 Male .....$2.49 DB-25 Female $2.49
Centronics Male .....$2.95 Centronics Female $2.95
HURRY WE WILL SOON BE SOLD OUT AT THESE PRICES!

3 WAY SWITCHED SCOPE PROBE

We have other probes, ask for our mini-catalog

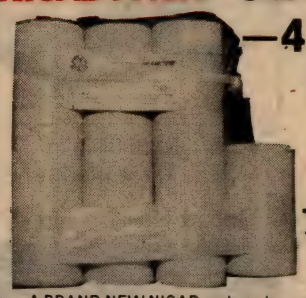
Fits All Makes & Model Scopes

1 ×1 *POSITION*
DC – 10 MHz
35 nS
55 p.F. + Oscilloscope Input Capacitance
1 MΩ (Oscilloscope Input)
600 Volts DC Including peak AC,

2 ×10 *POSITION*
DC – 100 MHz
3.5 nS
Nominal 16 p.F.
10–60 p.F.
10 MΩ When used with oscilloscopes which have 1 MΩ Input.

3 *REF POSITION*
Probe tip grounded via 9 MΩ resistor.

NICAD PACK 8.2 volt —4 amp hour



$14.95

7D cells

A BRAND NEW NICAD pack made up of American NICADS by GE. Each pack has 7 cells at 1.2 volts each. Full D sized and rated at 4 Amp hours this is a very good value. Consider the price of D cells at retail for $5-$6 each and you will agree they are cheap at.....$14.95

APPLE® BARE PC BOARDS PRICE SLASH!

NEW LOWER PRICES

16K Memory card, CPM compatible	$8.00
128K Memory card, Saturn compatible	$9.95
128K, APPLEIIe Ext 80 Column card	$9.95
ROM card for 6 EPROMS	$8.00
DISC Controller Std type	$8.00
DISC Controller 13/16 Sector	$8.00
80 Column Videx compatible	$8.00
80 Column Videx compatible with softswitch	$9.95
Z-80, The famous CPM card	$9.95
Z-80+, The famous APPLECARD, 64K RAM ON IT	$14.95
128K RAM expansion for APPLACARD	$14.95
RS-232 Serial data card, printer protocol	$8.00
Communication card, Modem protocol	$8.00
SUPER SERIAL Card, Printer and Modem Pr	$9.95
MODEM Card, SSM compatible	$14.95
EPROM PROGRAMMER Card, APARAT Comp	$14.95
SAM Talkin card	$8.00
COPYCAT CARD, WILD compatible	$8.00
TIME card, TIME II compatible	$9.95
TIME card, THUNDER compatible	$14.95
MUSIC card 9 voice GI chip	$9.95
GRAPHIC DUMP card, GRAPPLER compatible	$11.95
SPRITE ACTION GRAPHICS card for TI chip	$11.95
LARGE APPLE PROTOTYPE	$12.95
SHORT APPLE PROTOTYPE	$9.95
RGB CARD for APPLE, TTL output	$18.95
RGB card Mapping PROM	$9.95
DISC PROMS, set of two	$11.95
80 Column EPROMS, Set of 3	$16.95
Z-80+ EPROM	$9.95
MODEM EPROM	$9.95
COPY EPROM	$9.95
GRAPHIC DUMP EPROM	$9.95

ASCII KEYBOARD 8048

New Serial Parallel

$19.95

5v only

A great deal, this brand new ASCII keyboard came from AES DATA, one of the largest makers of word processors in the world. A novel circuit generates both serial and parallel ASCII out allowing use on both APPLE and IBM styles of system. The unit runs on +5V only, has Hall effect keyswitches and uses an 8048 micro for operation. The sculptured keytops are arranged in typewriter style for quick learning and are an attractive light beige color. We got them for 5% of the $169.00 that AES paid and so we can sell them dirt cheap and still make money. Completely new with 20 pin ribbon IDC connector and pinout for easy interfacing.....$19.95

QUALITY PRICES SERVICE NAKAI HAS THE BEST!!

Nakai Offer you 1 year Manufacturer's Warranty on Its 4 Layer Boards Compared to 90 days Warranty Offered by Many of Our Competitors.

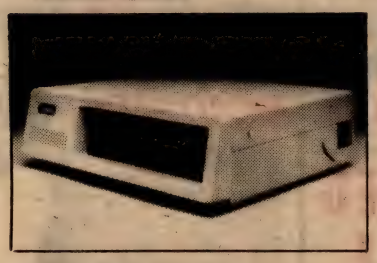
- Computer Soldered Board
- 4 Layer Board
- 1 Year Manufacturer's Warranty

Nakai Basic System

- A Nakai Computer Case
- A Keyboard
- A 135 Watts Switching Power Supply
- PU Packaging equal to IBM

Price : $199

Nakai Case

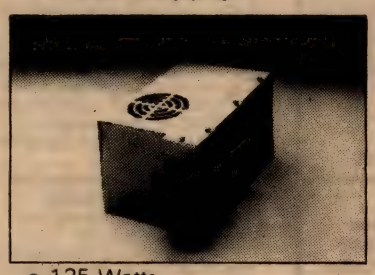


- Flip Top or Slide in
- Same Dimensions as PC/XT

Nakai Keyboard

- PC/XT Compatible
- By Cherry of West Germany Or
- By Misumi of Japan
- Large Return and Shift Keys
- LED for Capital and Number Look

Nakai Switching Power Supply



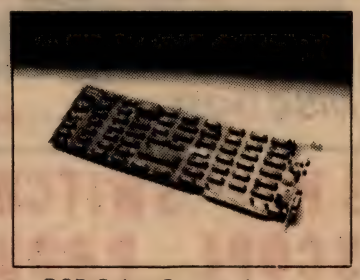
- 135 Watts
- Side Switch
- 4 Floppy Power Plugs

Nakai Mother Board

- 256 K Expandable to 640K on Board
- 4 Layer PC Board (Equal to IBM)
- (CPU) 4.77 MHz, 8088, 8087 Co-Processor Optional
- 8 Expansion Slots

Price : $239

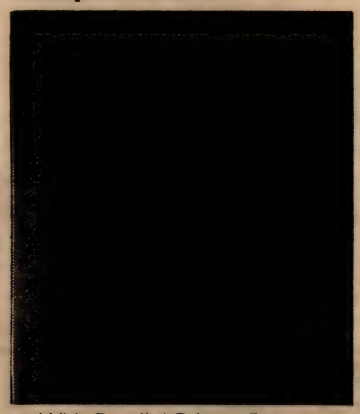
Nakai Color Graphic Card



- RGB Color, Composite, Monochrome Composite
- 4 Layer PC Board
- Text Mode: 40 Column x 25 Row 80 Column x 25 Row
- Graphic Mode: 320 Dot x 200 Line (Color, Black & White) 640 Dot x 200 Line (Black & White)
- Attribute: Reverse Video Blanking & High Light

Price : $105

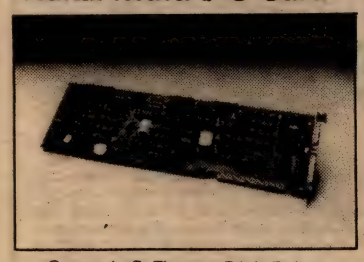
Nakai Monochrome Graphic Card



- With Parallel Printer Port
- Resolution: 720 x 34B
- 4 Layer PC Board

Price: $109

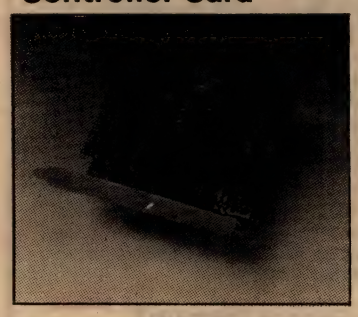
Nakai Multi I/O Card



- Controls 2 Floppy Disk Drives
- 4 Layer PC Board
- 1 Parallel Port
- 2 Serial Ports (1 Optional)
- Real Time Clock/Calendar
- Game I/O Port

Price : $135

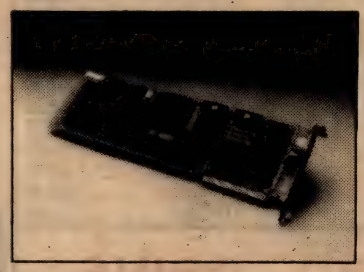
Nakai Disk Controller Card



- Controls 4 Disk Drives
- (2 internal and 2 external) 4 Layer PC Board

Price: $49

Nakai Trans-Net Card



Nakai Trans-Net Card is a Comprehensive, High Performance, Low-Cost, and Easy-to-Use Local Area Network (LAN) for IBM PC/XT and Compatibles.

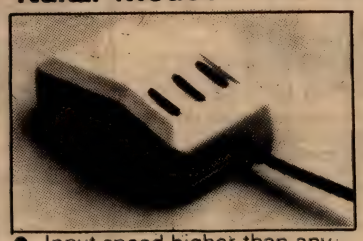
Nakai Trans-Net Local Area Network Transfers Data at 1 Million Bits Per Second Over A Twisted Pair Wire Cable Up to 4,000 Feet in Length, and as Many as 255 PCs can be Interconnected within A Network.

Price : CALL

NAKAI

Z-NiX COMPANY, INC.
9537 Telstar Ave., Suite #121
El Monte, Ca. 91731

Nakai Mouse



- Input speed higher than any devices
- No traditional grilled pad required
- Without using power supply adaptor
- No operating space limit
- IBM Compatibles.

With Software and Manual

Price: $69

DX-03 The Mailbox

With software mailorder firms in mind, the MAILBOX was designed for mailing or transporting diskettes safely and inexpensively.

- Maximum 3 diskettes
- capacity.
- Rigid PS plastic structure.
- Mailing Label.
- 4 colors for your selection.

Price: $1.00

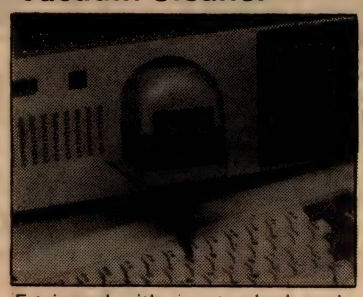
DX-08 Easy Holder

Designed to keep multiple diskettes programs both handy and in order, the EASY HOLDER is exceptionally convenient.

- Maximum 8 diskettes storage.
- Durable PS plastic body.
- Attractive color selection.

Price: $1.50

DT-51 Multifunction Vacuum Cleaner



Equipped with quartz clock and flashlight. Powered by dry cell or AC adapter. Ideal for cleaning IC sockets and hard to reach places.

Price: $12.00

DEALERS' INQUIRIES WELCOME • PHONE (818) 575-3700

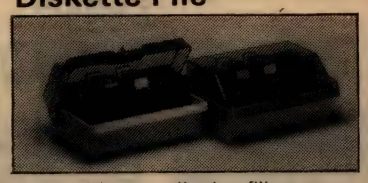
IBM and IBM PC/XT are Registered Trademark of IBM Corp.

DX-100N Deluxe Diskette File

- Diskette display filing system.
- Protective racks for diskette separation.
- Smoked PS plastic cover with lock.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.
- One Hundred diskette capacity.

Price: $13.00

DX-100B Deluxe Diskette File



- Double row display filing system.
- Protective racks for diskette separation.
- Smoked PS plastic cover with lock.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.
- One Hundred diskette capacity.

Pricve: $14.00

SS-25 Diskette Holder For 3-½" Disc

Special storage box for 3-½" diskettes.

- Capacity: 25 pcs diskette.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.

Price: $8.00

SS-50 Diskette Holder For 3-½" Diskettes.

Special storage box for 3-½" diskettes.

- Capacity: 50 pcs 3-½"
- diskette.
- High impact plastic lid and base.
- Easy access handle for opening and carrying.

Price: $12.00

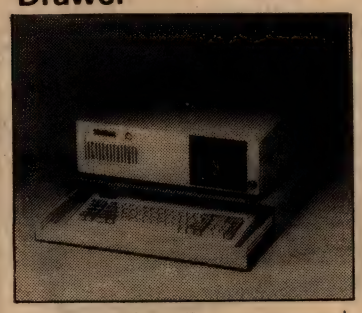
DT-01 CRT Tray

The way to bring your CRT up to peak effeciency! Fit this high impact plastic tray on top of CRTs to keep paperwork and printous neatly organized.

- Holds up to 500 sheets of paper.
- 4 rubber feet keep tray securely in place while letting air flow between the tray and CRT.
- Smart gray color.
- 4 expandable plastic hole to connect any accessories you need.

Price: $6.00

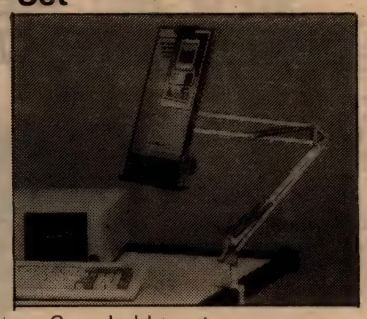
DT-21 DT Easy Drawer



Computer & CRT are supported by baked enamel, reinforced 20 gauge steel platform. The cantilever drawer, supported by ball bearing slides, holds a keyboard up to 2-¾"(h) x 19-¾"(w) x 9-½"(d), and extends to a lock position.

Price: $39.00

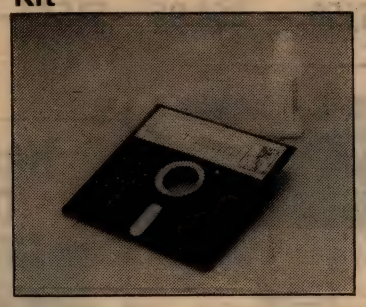
DT-32 Copy Holder With Adjustable Arm Set



- Copy holder set.
- Adjustable arm set, makes copy holder movable and easily adjustible to the position and angle most satisfactory to you.

Price: $15.00

FD-05 Head Cleaning Kit



- Will not harm drive.
- Easy to use, insert like an ordinary diskette.
- Appropriate for both single and dual sided drives.
- 5-¼" cleaning diskettes.
- One bottle of cleaning solution.

Price: $5.00

DD-01 Easy Ware, DD-02 Disk Notcher

DD-01 5-¼" DS/DD diskettes

Price: $0.70

DD-02 DISK NOTCHER helps you save money by using the other flip side for backup copies.

THE DISK NOTCHER cuts write enable notch precisely & cleanly.

Price: $5.00

SPECIALTY OF THE MONTH

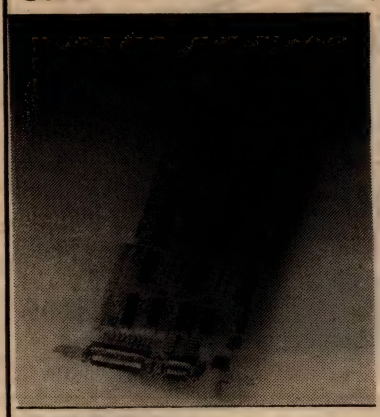
Accessories

DX-100B Diskett Box

- Double Row Display Filing System
- Smoked PS plastic Cover with Lock
- High Impact Plastic Lid and Base
- Easy Access Handle for Opening and Carrying
- Protect Up to 100 5¼" Diskettes

Regular Price : $14.00
NOW : $8.00

Nakai Multifunction Card



- Clock/Calendar with Battery
- RS-232 Adapter
- Parallel Printer Adapter
- Game Controller

Regular Price : $119.00
NOW : $85.00

NAKAI

Z-NiX COMPANY, INC.
9537 Telstar Ave., Suite #121
El Monte, Ca. 91731

DEALERS' INQUIRIES WELCOME • PHONE (818) 575-3700

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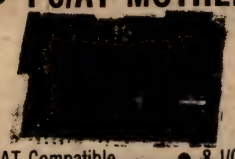
IBM CLONE HEADQUARTERS

IBM™ AT COMPATIBLE!

● PC/AT MOTHER BOARD



$850.00

- IBM/AT Compatible
- 640K Installed
- ROM BIOS Included
- 8 I/O Slots
- On Board Clock
- 1 yr. warranty

WE'VE GOT THE NEW QUMETRAK 142 LX DRIVES

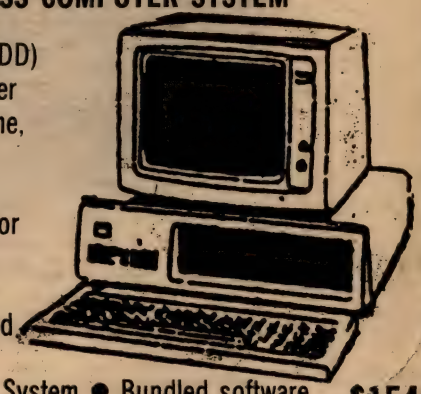
- Double Sided Double Density
- ½ Height ● 48 TPI
- New Quiet Operation
- IBM Compatible
- New Front Panel Design

$69.95 Each 2/$129.95

Dealer Inquiries Invited

20 MEG TURBO COMPUTER

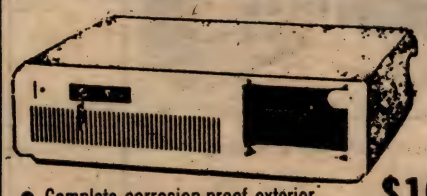
A NO NONSENSE FULL BLOWN BUSINESS COMPUTER SYSTEM



- Dual ½ drives (DSDD)
- 20 Meg. & Controller
- Parallel, Serial, Game, clk/cal
- 640K memory
- Monochrome monitor (TTL)
- Monochrome card
- Compatible keyboard
- 135W Supply
- DOS 2.1 Operating System ● Bundled software
- 1 Yr. Warranty

$1549

● PC/AT COMPATIBLE CASE

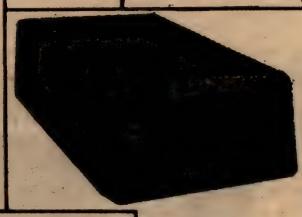


- Complete corrosion-proof exterior
- Anti-electric conduct
- Include keylock assembly, drive rail, speaker holder and accessories for easy assembly.

$105.00

IBM COMPATABLE KEYBOARDS

5150 — $64.95 5151 — $89.95



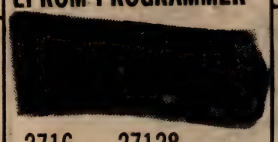
DISKETTE DUPLICATOR

Stand-a-lone unit will copy information from one diskette - track by track - to another diskette. No computer needed! Copies all format diskettes as well as all copy protected diskettes. Takes only 45 seconds to copy. Extremely easy to use.

$895.00

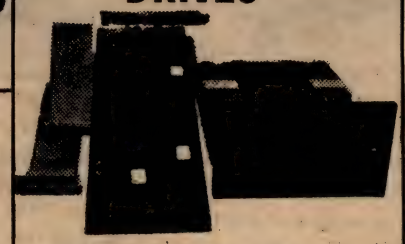
● PC/AT COMPATIBLE KEYBOARD

EPROM PROGRAMMER



2716 — 27128
$129.00

HARD DISK DRIVES

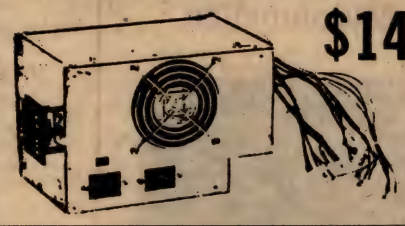


- CMI 20 Meg ½ High $325.00
- Microscience 20 Meg ½ High $330.00
- Hard Disk Controller w/cables $130.00

IBM ADD ON BOARDS

STOCK#	DESCRIPTION	PRICE
FDC-501	Floppy disk controller w/cable - 4 drives	$45
FDC-507	Floppy Cont. w/serial, parallel & clock	$120
HDC-515	Hard disk controller w/cables (Omti)	$139
VID-401	Color Graphics Cards, IBM Specs.	$80
VID-405	Magic Video card w/TTL, RGB, & Composite outputs 640x400 color, 640x352 monochrome	$185
VID-406	Monochrome (TTL) card	$75
VID-408	Hi-Res mono/graphics w/printer port Hercules compatible	$99
SIO-250	Serial port card (second serial opt.)	$35
PIO-255	Parallel printer card	$29
MFC-110	Short I/O, parallel, serial, clk/cal	$99
MFC-100	Multi-funct. w/para., ser., clk/cal & 384K Exp. No mem. installed. Software	$109
MFC-120	576K memory expansion board (short card)	$65
EP-128	EPROM burner board, for IBM (2716-27128)	$129
RD-2	Bus Receiver & driver boards for Exp. chasis	$149

● 192 W AT POWER SUPPLY



$149.00

135 WATT IBM Power Supply
● 4 Drive Connectors
$85.00

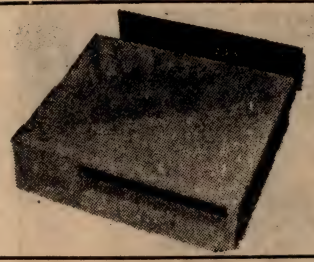
● FLOPPY & HARD DRIVE CONTROLLER

$295.00
WESTERN DIGITAL

MULTI I/O $99.00

- Serial & Parallel Ports

SHORT CARD



COMPUTER CASE FCC APPROVED

- Slide Off Cover
- Side Switch Power Sup.
- All Hardware

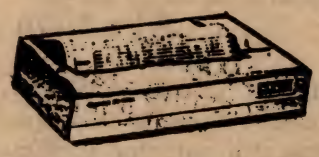
$59.95

1.5 MB MULTI FUNCTION

- Expandable to 1.5 MB
- Serial
- Parallel ● Game Port

$269

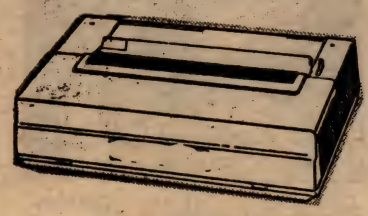
CANNON PRINTERS



#1156A $275
CANNON PRINTERS

- Self Test ● 160 CPS Dot Matrix
- 27 CPS near letter quality mode
- Parallel interface
- BiDirectional printer
- Friction or sprocket feed
- Full Epson character set w/graphics
- 132 column

QUME PRINTER

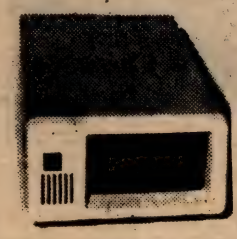


QUME LETTER-PRO 20

- Letter quality Daisy Wheel
- Cassette Ribbon
- 22 CPS Print Speed
- Bi-directional carriage
- Parallel Interface

$425.00

EXTERNAL DRIVE CASE & POWER SUPPLY



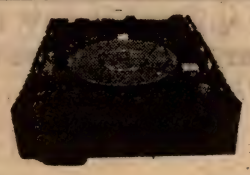
- 75 W Power Supp.
- Drive Power connect.
- IBM Styling

$99.00

SPEED UP YOUR IBM OR COMPATIBLE BY 33% $14.95

New Y-20 CPU Mfg. by NEC replaces the 8088 in your system. No compatibility problem. New on market so order early before high demand makes these scarce!!

AT/DRIVES



360K - ½ hgt. DSDD	$69.95
1.2 Meg Quad	$145.00
20 Meg. (45Msec)	$585

TAIWAN BASIC

Run Basic
On Your IBM Comp.
$39.95

LOLIR LECTRONICS CORP.

13933 N. CENTRAL EXPRESSWAY
SUITE 212
DALLAS, TX 75243
214-234-8032 — 214-234-8056

TERMS: Check, M.O. or MC/Visa. COD's add $1.90. Shipping add $3.50. TX Res. add 6-1/8% Tax.

master charge VISA

MORE COMPUTER SURPLUS BARGAINS

TI COMPUTER SURPLUS

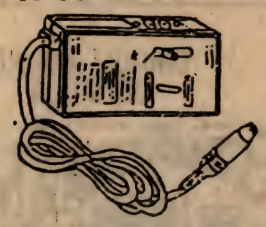
TI 640 OFFICE SYSTEM REPLACEMENT PARTS

CRT Controller boards $79
Floppy controller boards $85
AU Boards $50
SM1/M boards $50
8" Disc Drives $70
Power supply $85
Front door panel $45
Rear door panel $40

TI 990 COMPUTER SURPLUS

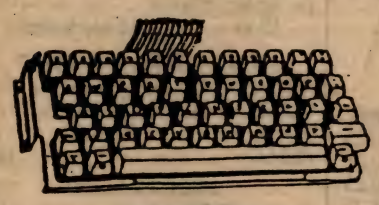
MAIN Chasis w/card slots, front panel, & power supply $125
Dual 8" Drives w/power supply ..$125

TI 99-4A SURPLUS



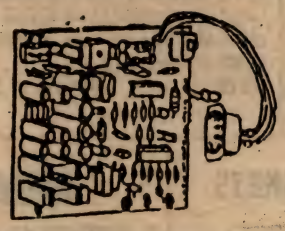
SOUND & VIDEO MODULATOR

TI #UM1381-1 — can be used with all video sources. Built-in A-B switch. Channel 3 or 4 output. Requires 12VDC power $3.50



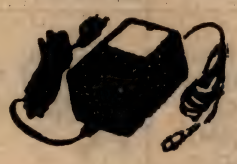
KEYBOARD

PN 900181 — 48 keys. Measures 4"x9". Terminates to a 15 pin connector **$3.75**



SWITCHING POWER SUPPLY

INPUT: 14 VAC to 25.5 VAC.
OUTPUT: +12VDC @ 350MA.
+5VDC @ 1.2AMP.



WALL PLUG ADAPTER

TN-21 — used with the above power supply. Output 21VAC @ 45VA.
TN-21.....**$3.50 ea or 10/$19.95**

CASSETTE INTERFACE CABLE

CIC-93 — has DB-9 connector on one side to 3 RCA phono jacks on the other end. **$1.50 ea or 10/$10.00**

TI GAME CABLE

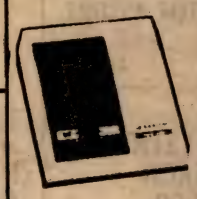
CAB-15 — one end has a DB25 female going to 2 DB15 female connectors. Cable is 6' long ..**$4.00**

MFG. BY ELSTON

COMMODORE SURPLUS

12" GREEN SCREEN MONITOR

Composite Video Input built in power supply. Requires 18VAC XFMR.
Useable on IBM's $19.95
Transformer for Above $3.50



BIZCOMP VERSAMODEM

Sends and receives at 300 baud Selectable originate/answer modes. Full duplex operation. Direct connect to phone. Bell 103 compatible. Comes with AC adapter.

Compatible with all computers having RS 232 port **$34.95**

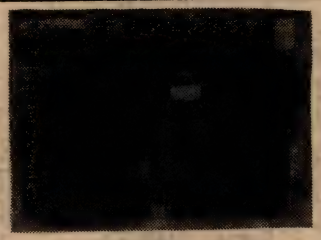
KAYPRO SURPLUS

KAYPRO EQUIPMENT

9" Green Monitor (K2) $45.00
81 Series ROMS (K2) $7.00
Keyboard (K2 New) $75.00
Keyboard - Siemens w/case ...$65.00

KAYPRO MAINBOARDS

K2 Socketed (no ICs) $37.50
K2 populated, tested $129.00
K10 tested $225.00
Pro-8 Upgrade kit $39.00



STANDARD XT REPLACEMENT MOTHERBOARD

- 256K Max
- 8 Slot
- 4.77 MHZ Speed

$140 — W/OK

PUBLIC DOMAIN SOFTWARE

IBM COMPATIBLE
$3.75 / DISKETTE

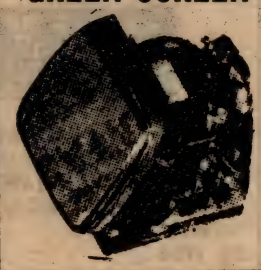
PC-Write — Word Processor
PC-File — Database Manager
PC-Calc — Spreadsheet
PC-Desk — Desk-top Manager
Games 1 — Arcade Games
Games 2 — Arcade Games
PC-Business — Business Accounting
PC-Home — Home Management

9" HIGH RESOLUTION (TTL) VIDEO MONITOR

NEW

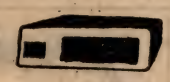
Green Screen
12 VDC Required
Originally used in portable computers.
Stk. #964-02 .....$19.95

SAMSUNG 12" TTL GREEN SCREEN MONITOR

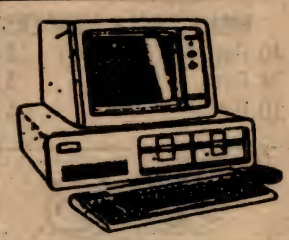


REQUIRES 15VDC IN.

EXPANSION CHASIS FOR IBM'S



Case.....$59.95
Exp. Board $69.95
Power Supply $69.98
Driver - Rec. $149.00

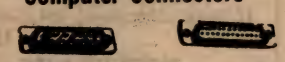


BASIC IBM COMPATIBLE SYSTEM

- Motherboard w/256K
- Power Supply
- Case
- Keyboard

$375.00

Popular DB Series Computer Connectors



9 Male Solder pot $1
9 Female solder pot $1
9 hoods.....$.65
25 male solder pot.....$1.25
25 female solder pot $1.25
25 hoods .....$.75

$149.00

Diablo S-11 Printer
100 CPS
Near Letter Qual. Mode

INTERDYNE 10-MEG TAPE BACK-UP

$399.00

With Mtg. Bracket, Sftwr. & Manual

TTL MONITORS

Roland CG122
High Res.
IBM Compat.

$99.00

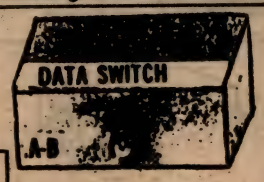
SUPER SURGE HASH FILTERS

$15.00

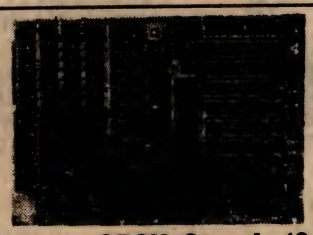
6 Outlets, Fused, Mov. & LC Circuits

SHUGART 8" DISC DRIVES

FOR XEROX 820
SSDD $65.00



This A-B switch lets you share your computer with any two peripherals (serial or parallel). All 25 lines are connected. Has one DB25 female input & two DB25 female outputs.
Stk. #AB25 .....$39.95



TEXAS TURBO BOARD

256K Stand. (640K Max)
4.77 & 7.77 MHZ
IBM Footprint
8 I/O Slots

Tested w/OK Mem.....$180
Tested w/640K Mem.....$245

XEROX 820-1

XEROX 820-I
Z80 SINGLE BOARD COMPUTER

- 64K RAM
- 80 x 24 Video
- Floppy disk controller
- 2 parallel ports
- 1 serial port

Assembled & Tested
$89.95

XEROX 1810 MOTHERBOARD

The 1810 is a portable CPM machine that never made it into mass production. These Z-80 Motherboards are becoming collectors items. These boards have on-board serial, parallel, video w/RF modulator, & 64K memory. Boards are solder line rejects and are missing some chips. ROM set included. Limited quantity so order early!!!
Xerox Xerox-1810 .....$39.95
CPM Boot Disk $6.00
Power Tranformer for 1810 .....$12.50

RADIO-SHACK COMPUTER SURPLUS

TRS-80 Mod III motherboards populated boards with all IC's except ROM & RAM. We have a ton of these to close out!
TR-3A Complete undamaged boards, easy to bring up .....2/$24
TR-3B damaged boards with hole or corner clipped .....3/$14
Mod III ROM set $20
Mod III RAM set $15

TANDY 2000 MOTHERBOARDS

Assembly line rejects. Circuit boards are undamaged. These boards are very repairable. No RAM, ROM or PROM installed.
Stk. #TRS-2000D.....$29.95

TANDY MODEL 4 MOTHERBOARDS

We found a box of boards with one damaged edge card connector. All components are there except for ROM & RAM. Order early!
Stk. # TRS-40 .....$12.95

MODEL 3 KEYBOARD CAPS

A complete set of key caps to replace your lost or broken keys. 100 sets available.
Stk. #TRS-3KC.....$6.95/set

KEYBOARD SWITCHES

We have Radio Shack keyboard replacement switches to fit just about every model.
Stk. #TRS-SW .....2/$1.50

REPLACEMENT ANTENNAS

Replacement antenna for Tandy Radios. Fits many models.
Stk. #TRS-Ant .....3/$1.00

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master charge VISA

214-234-8116 ELECTRONIC SURPLUS SPECIALS 214-234-8105

LOW PROFILE SOCKETS (TIN)

# OF PINS	PRICE
8	$.08
14	$.10
16	$.12
18	$.15
20	$.18
22	$.18
24	$.20
28	$.25
40	$.30

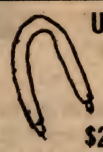
ELECTRONIC PIEZO BEEP BUZZER

Special — 2/$1.00

7/8" Diameter element on plasting mounting. Originally used in Radio Shack telephones as the ringer.

Stk. #PZO-78 ..... $.75

ULTRAVIOLET TUBES GOOD FOR EPROM ERASERS 110 VAC



$2.25 ea — 10/$15.00

8" DRIVE POWER SUPPLIES $24.50

8" DISK DRIVE POWER SUPPLY

Heavy duty supply can run up to 4 drives. Enclosed frame. Input: 117 VAC. Output: 5VDC @ 7 AMPS; +24VDC @ 6 AMPS; −24VDC @ 6 AMPS.

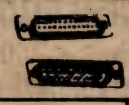
Stk. #PS-8 ..... $24.50

$9.95

Stk. # WTN-1810

XEROX 1810 POWER TRANSF.

EXTREMELY HARD TO FIND!!



DB25 CONNECTOR ASSORT.

Removed from equip. (useable) Male & Female ..... $10/$2.00

BUILD YOUR OWN EPROM ERASER

115VAC BLACK LIGHT (ULTRA VIOLET)

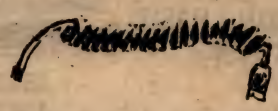
115 volt ultra violet light, with lamp, ballast and in-line cord switch. Just build enclosure to finish.

Stk. #EPB-125 ..... $12.50

SUB MINI SIZE FET CONDENSER MICROPHONE

Good for use in wireless microphones.
Omni-Directional
Resp: 50HZ - 8KHZ
Output Z = 1K OHM
Power Sup. = 1.5V
SPL = 120DB Max.

Stk. #MIC-120 ..... $1.00



COILED CORD BONANZA

4 Conductor coiled cord. Black vinyl jacket. Extends to 6 ft. No connectors on either end.

Stk.# CC-000 ..... 3/$1.00

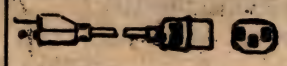
4 Conductor coiled cord. Black vinyl jacket. Extends to 6 ft. Phone connector on one end and no connector on the other.

Stk. # CC-020 ..... 2/$1.00

4 Conductor coiled cord. Grey vinyl jacket. Extends to 6 ft. Used as keyboard cable. Phone jack to 5 pin din connector.

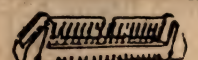
Stk. #CC-100 ..... $4.00

COMPUTER POWER CORDS



$1.25 EA — 10/$10

COLECO JOYSTICKS $2.50 EACH 10/$17.00



RIGHT ANGLE HEADERS

40 Pin	$.40
34 Pin	$.50
10 Pin	$.25

TRANSFORMERS

STK.#	PRI (VAC)	SECONDARY (VAC)	PRICE
TN-6.3	117	6.3 @ 300ma.	$1.25
TN-12	117	12 @ 400ma.	$1.35
TN-24A	117	24 @ 200ma.	$1.25
TN-24B	117	24ct. @ 3.6ma	$3.50

CIRCUIT BOARD BONANZA

Sound generator boards removed from electronic pin-ball games. Contains oscillators, control circuits, & 2 watt audo amp. Experimenters dream!!!

$2 ea — 10/$12.50 w/schematics

5V & 12V REGULATOR BOARD

Regulator board containing 5v & 12v TO-220 regulators, fuses, bridges, caps & I/O connectors. Size 2"x4" w/heatsinks.

REG-512 ..... $3.50

RECTIFIER BOARD

Contains (4) 10amp bridges, (3) large filter caps, & I/O conn. Size 4.5"x8".

BRDG-4 ..... $2.50ea or 10/$12.50

LINEAR & CMOS BONANZA

Circuit board removed from SINGER electronic calculators. Has 20 linear & cmos IC's & a wealth of other parts.

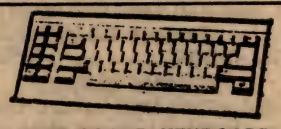
BD-20 ..... $2.50ea or 10/$12.50

for robotics, precision movement application, etc.

STEPPER MOTOR

(Unifilar Wound)
5 VDC 3½ Watts 7.5°X
48 Step/Rev. 28 RPM

Stk. #MO-5 ..... $3.50



UNENCODED KEYBOARD

Full size kybd. w/number pad. 70 keys w/LED power indicator. Orig. from dumb terminals. New!! Mfg. by Hi-Tek.

Stk. #Kybd-70 ..... $9.95

ELPAC POWER SUPPLY

For TV game & computer peripheral equipment. Rated 110VAC input. Output: +5VDC @ 860MA., +12VDC @ 300MA., & −12VDC @ 300MA. Model #WM-113.

Stk. #WTN-113 ..... $6.75

WIRE

TEST PROBE WIRE

18 Gauge rubber coated. Red, black, white or blue ..... 100'/$13

HOOK-UP WIRE

24 Gauge stranded cond. 22 Gauge solid conductor, your choice ..... 100"/$2

WIRE WRAP WIRE

30 Gauge solid cond. Choice of colors. Wir-30 ..... 100'/$2.50

CRYSTALS

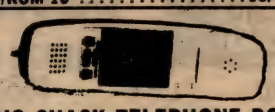
FREQUENCY	CASE PRICE
4 OMHZ HC 18	$1.25
6 OMHZ HC 18	$1.25
8 OMHZ HC 18	$1.25
10 7MHZ HC 18	$0.75
14 318MHZ HC 18	$1.25
18 432MHZ HC 18	$1.25

ATARI GAMES

ATARI GAME ROMS

An assortment of 10 different Atari game ROMs. Simply open any Atari cartridge & replace the existing ROM with a new one. Play another 10 games instantly!

Stk. #ROM-10 ..... 10/$2.50



RADIO SHACK TELEPHONE BOARD

Main circuit board from Radio Shack portable phone. Complete board w/microphone, decoder chip, ringer & many electronic components.

Stk. #BD-100 ..... $2.25 — 10/$15.00

DC-DC CONVERTER MODULE

Converts 5 VDC To 27 VDC Up To 27 MA

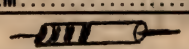
Excellent for using CMOS device along with TTL devices from same 5 volt source.

Stk. #CONV-27 ..... $2.50

VITEK CABLE CONVERTER

Model No. TC-1M Converter. Both Mid-Band & VHF frequencies. Has built in power supply. Units are new & in working cond.

Stk. #TC-1M $9.95



1000 PIECE RESISTOR ASS'T. ALL SIZES & VALUES

Stk. #RES-1000 ..... $3.00

3 VOLT LITHIUM BATTERY

Used as battery back-up on most multi-function cards.

Mallory BR-2325

$1.00 EACH — 10/$5.00

Holder for above — $.75

ATARI REPLACEMENT POWER SUPPLIES

11.5 VDC @ 1.95 AMP

Stk. #WTN-195 ..... $6.75

IBM POWER PACK

Used with IBM Model 4860. Input is 117VAC & Output is 17.7VAC @ 75VA. Mfg. by Mid West Xfmr.

Stk.#WTN-4860 ..... $16.75

WALL PLUG ADAPTERS

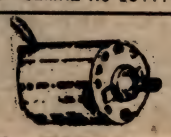
6VDC @ 300ma

$1.75 or 10/$12.50

ISOLATION TRANSFORMER

117VAC: 117VAC @ 125VA MFG. BY SIGNAL TRANS.

$3.00 Each — 10/$20.00



12 VDC TOY MOTOR

Stk. #MO-12 ..... 2/$1.00

RELAY ASS'T 10 RELAYS

REL-10 ..... $2.50

POWER SUPPLY MFG. BY GENERAL INSTR.

INPUT: 110VAC
OUTPUT: +5VDC @ 5AMPS
+12VDC @ 2.5AMPS
−12VDC @ 3AMPS

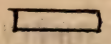
PS-120 ..... $24.50

VOLTAGE REGULATORS

7805 5v 1.5 amp
7812 12v 1.5 amp
7824 24v 1.5 amp
7905 −5v 1.5 amp
7905 −5v 1.5 amp
7912 −12v 1.5 amp

$.43 EACH

MAGNETS



2" Bar Magnet With Tape On One Side

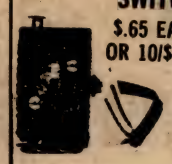
2/$1.00

COMPUTER SPEAKERS

2.25" 8 ohm .25 watts. This is the same speaker that IBM uses. Excellent for computer builders.

Stk. #SPK-8 ..... $.65

TV-GAME SWITCH



$.65 EACH OR 10/$4.25

WALL PLUG ADAPTERS

12VAC @ 265MA	$1.75
21VAC @ 2AMP	$2.50
6VDC @ 300MA	$2.00

ULTRASONIC TRANSDUCER

Don't know what these came out of but this is a doozey of a device. Unit is an aluminum cylinder containing a piezo-ceramic with an adjustable coil in parallel. Frequency is 24 khz. Can be used in many ultrasonic circuits.

Stk. #ULT-58 ..... $2.25

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We Received A Large Shipment Of These Cable Converters. Good Savings!

Complete Unit — $24.50
Mainboard — $12.50
Power Supp. — $7.50

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COLOR ADAPTOR	$ 82.
MONOCHROME ADAPTOR	$ 82.
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PCXT MOTHER BOARD, W/256K,	$ 176.

*IBM COMPATIBLE

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10MB W/CONT. $459.00

20MB W/CONT. $695.00

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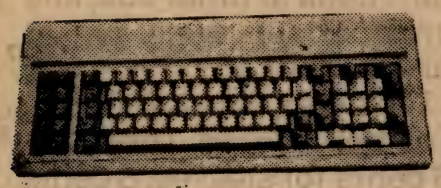
$55.00



5150 STYLE KEYBOARD
W/ MODE LIGHTS

$70.00

150W POWER SUPPLY
$110.00
READY FOR HARD DISK
TAPE DRIVE &
INTERNAL MODEM

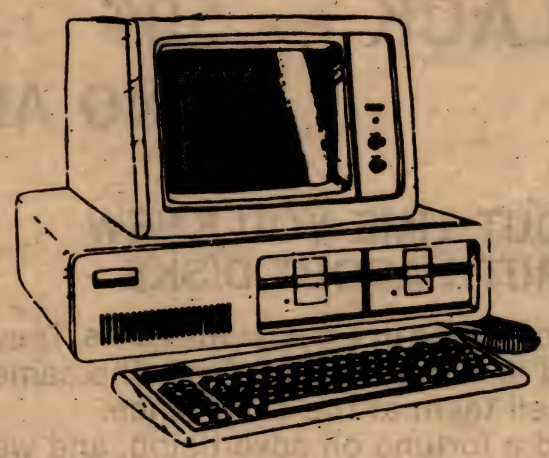
PCXT SYSTEM

$695.-*

* MOTHER BOARD W/256k RAM EXPANDABLE TO 640k, 8 EXPANSION SLOTS, 4.77MHZ OPERATION.
* COLOR GRAPHICS OR MONOCHROME ADAPTOR
* 150 WATT POWER SUPPLY HARDDISK, MODEM AND TAPE DRIVE READY
* 1/2 HIGH 360K DISK DRIVE
* 4 DRIVE FLOPPY DISK CONTROLLER
* 5150 STYLE KEYBOARD WITH MODE LIGHTS
* MULTI I/O ADAPTOR W/ REAL TIME CLOCK, PARRALLEL AND SERIAL
* STURDY FLIP-TOP CASE

TURBO MOTHER BOARDS

$279.00
256K RAM,
EXPANDABLE 640K,
8 EXPANSION SLOTS,
4.77MHZ & 6.67MHZ,
KEYBOARD SELECTABLE.



ASSEMBLY 30.00 DOLLARS

THESE LOW PRICES ARE ONLY AVAILIBLE IF YOU ASSEMBLE THE SYSTEM YOURSELF WITH OUR EASY TO FOLLOW DIRECTIONS.

* FOR YOUR CONVENIENCE, A MONITOR HAS NOT BEEN ADDED TO THESE SYSTEMS. PLEASE SELECT YOUR MONITOR BELOW.

PCXT TURBO SYSTEM

$795.-*

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* COLOR GRAPHICS OR MONOCHROME ADAPTOR
* 150 WATT POWER SUPPLY HARDDISK, MODEM AND TAPE DRIVE READY
* 1/2 HIGH 360K DISK DRIVE
* 4 DRIVE FLOPPY DISK CONTROLLER
* 5150 STYLE KEYBOARD WITH MODE LIGHTS
* MULTI I/O ADAPTOR W/ REAL TIME CLOCK, PARRALLEL AND SERIAL
* STURDY FLIP-TOP CASE

12" COMPOSITE GREEN	$ 100.
12" COMPOSITE AMBER	$ 105.
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* WE OFFER A 6 MONTH GUARANTEE!!!
* SORRY, BUT WE MUST ASK YOU TO PAY SHIPPING & 3% ON M/C & VISA (WE WILL PAY THE OTHER 1%)
* WE ACCEPT CASHIERS CHECKS(PLEASE NO PERSONAL CHECKS)
* WE RESERVE THE RIGHT TO LIMIT QUANITIES

*** WE HOPE TO HEAR FROM YOU SOON.
*** THANK YOU FOR SHOPPING WITH US!!!

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Single and double sided disks cost the same. They are manufactured at the same time from the same material, so we sell them at the same price.

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In the past, we have sold to software houses, programmers, and large institutions. Due to an increase in our production, we are able to provide you, the *COMPUTER SHOPPER* reader with an extraordinary deal. You can buy from us with confidence. If for any reason you are not satisfied with our diskettes, return them within 30 days and we will refund your money.

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Customer service hours are: Monday through Friday, 9am to 5pm Pacific time. Order by phone, mail or telex. Pay by Mastercard or VISA, COD or send a check with your order.

U.S/DISK utilizes the latest automated production lines, to produce the highest quality, certified 100% error free diskettes, at the lowest possible cost. The high standards established for our disks are maintained by the selection of the finest available materials, and extra rigid quality assurance, testing and manufacturing.

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SR-10, 200 cps, 10" carriage	499
SR-15, 200 cps, w/tractor	599
SB-10 Draft & NLQ 24 wire printhead	625

OKIDATA
ML182P 120 cps	We
ML182 IBM Graphics Comp	Will
ML182S 10" Carriage	Beat
ML192P, 160 cps	all
ML192 IBM Graphics Comp	Pricing
ML192S, 160 cps	on
ML193P, 160 cps	Oki
ML193 IBM Graphics Comp	Printers
ML193S, 160 cps	with
ML84P, 200 cps	or
ML84 IBM	without
ML84S, 200 cps	IBM
Okimate 20	Rom

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FX80 +, 160 cps, 10" carriage	Us
RX100, 100 cps, 15" carriage	First
FX100 +, 160 cps, 15" carriage	For
LQ1500 Draft NLQ	Lowest
SQ2000, All New	Prices

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HR-25	$ 439
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10 Meg w/Controller Card	$ 529
20 Meg w/Controller Card	629
30 Meg w/Controller Card	999
20 Meg for AT	550
33 Meg for AT	775

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A-2	$ 155
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Controller Add	55
10 meg. w/cont.	645
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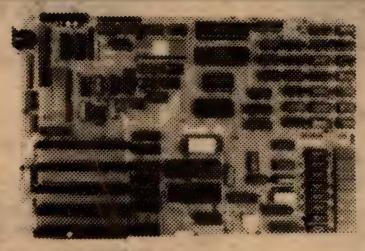

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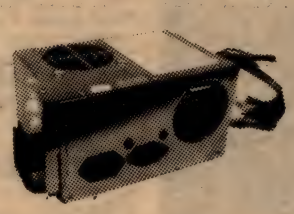

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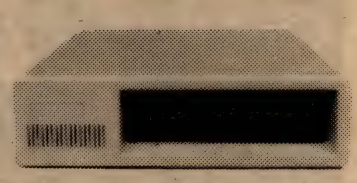

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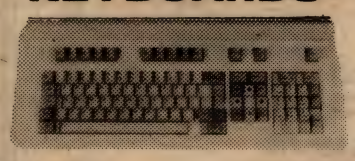

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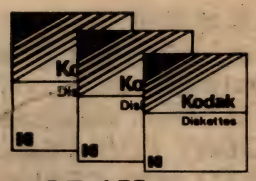

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–call pickup
–call waiting
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–station paging
–talkback to paging station
–two intercom links
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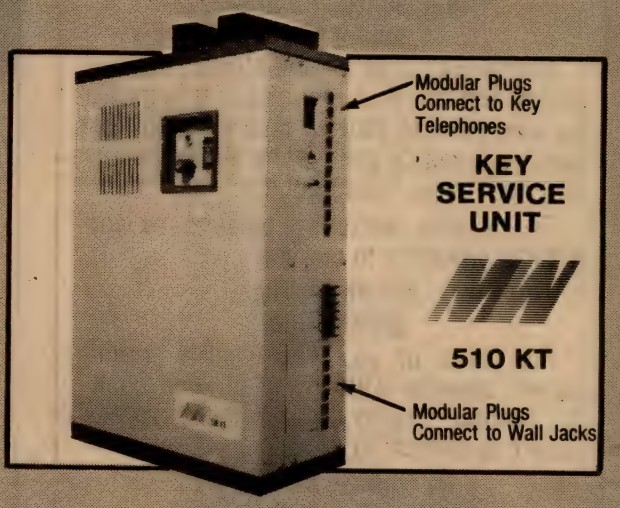
–line status indication
–distinctive ringing
–hold
–exclusive hold
–I-hold
–hold recall
–privacy
–monitoring
–do not disturb
–three-way conferencing
OPTIONAL FEATURES
–zone paging via external speakers
–speaker phone
–hand free talk back
– (SMDR) time/date/# called/duration recording (optional)
–call message display
–time of day display
–stop watch for call time
–directory of abbreviated dialing number display
–feature operation display
–dialed number display
–canned message content display
–adjunctor converting POT set into 510 KT compatible set
SPECIFICATIONS
Central Office line capacity: 5
Intercom link: 2
Key sets capacity: 10
Input power: AC 110V 50/60 H_z
Power consumption: 40 watt
Cable: 6-wire, Star Connection
Dimension & Wt: 17" x 12.5" x 5.5" 22 lbs.
Operating temp: 32-104 degrees F



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Station paging
ICM HF talk back

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Distinctive ringing
Hold
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I-hold
Hold recall
Privacy
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Do not disturb
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Intercom link: 1
Key sets capacity: 6
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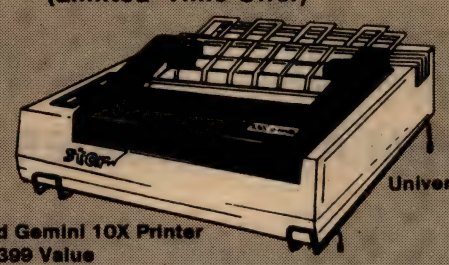

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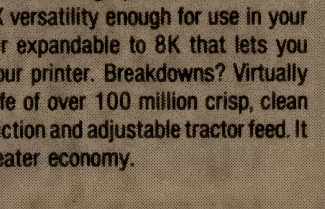

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Drive controller, Parallel, Serial, optional second Serial, Clock Calendar W Battery Back-up, RAM disk, Spooler software.

***OPTIONAL PROCESSOR:**
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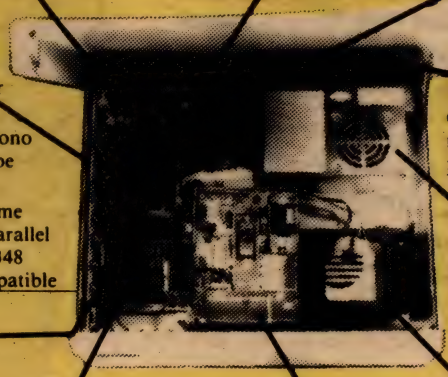
*Optional Monochrome Graphics Display/Parallel Printer port. 720 * 348 Pixel Hercules Compatible



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From *The San Francisco Examiner*, John C. Dvorak, September 8, 1985 D-3
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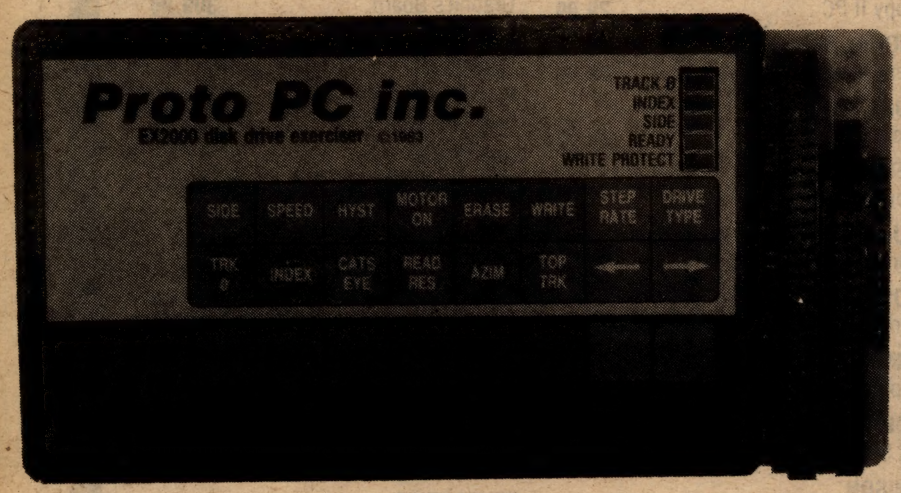

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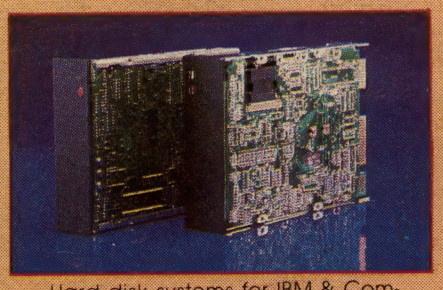

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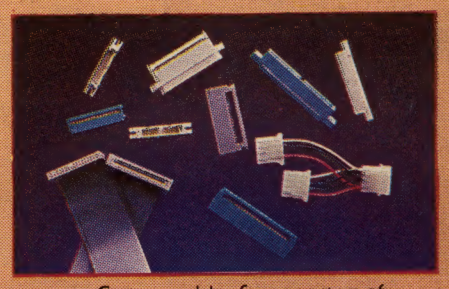

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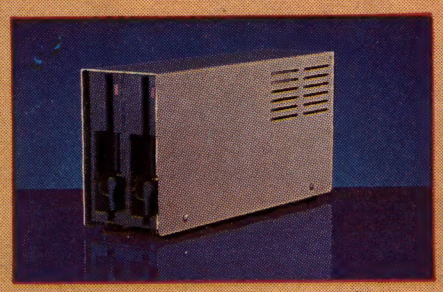

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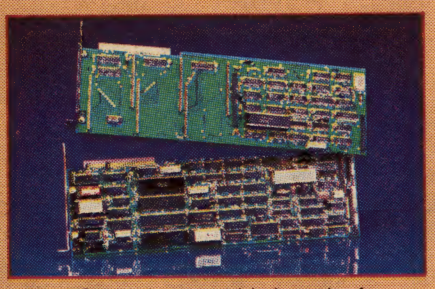

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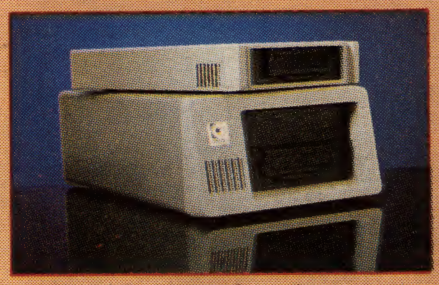

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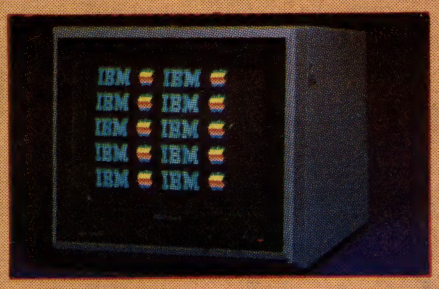

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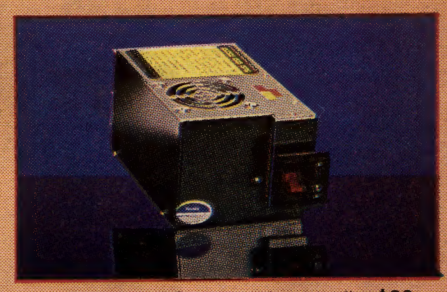

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